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COTTON

THE TEXTILE MANUFACTURING JOURNAL

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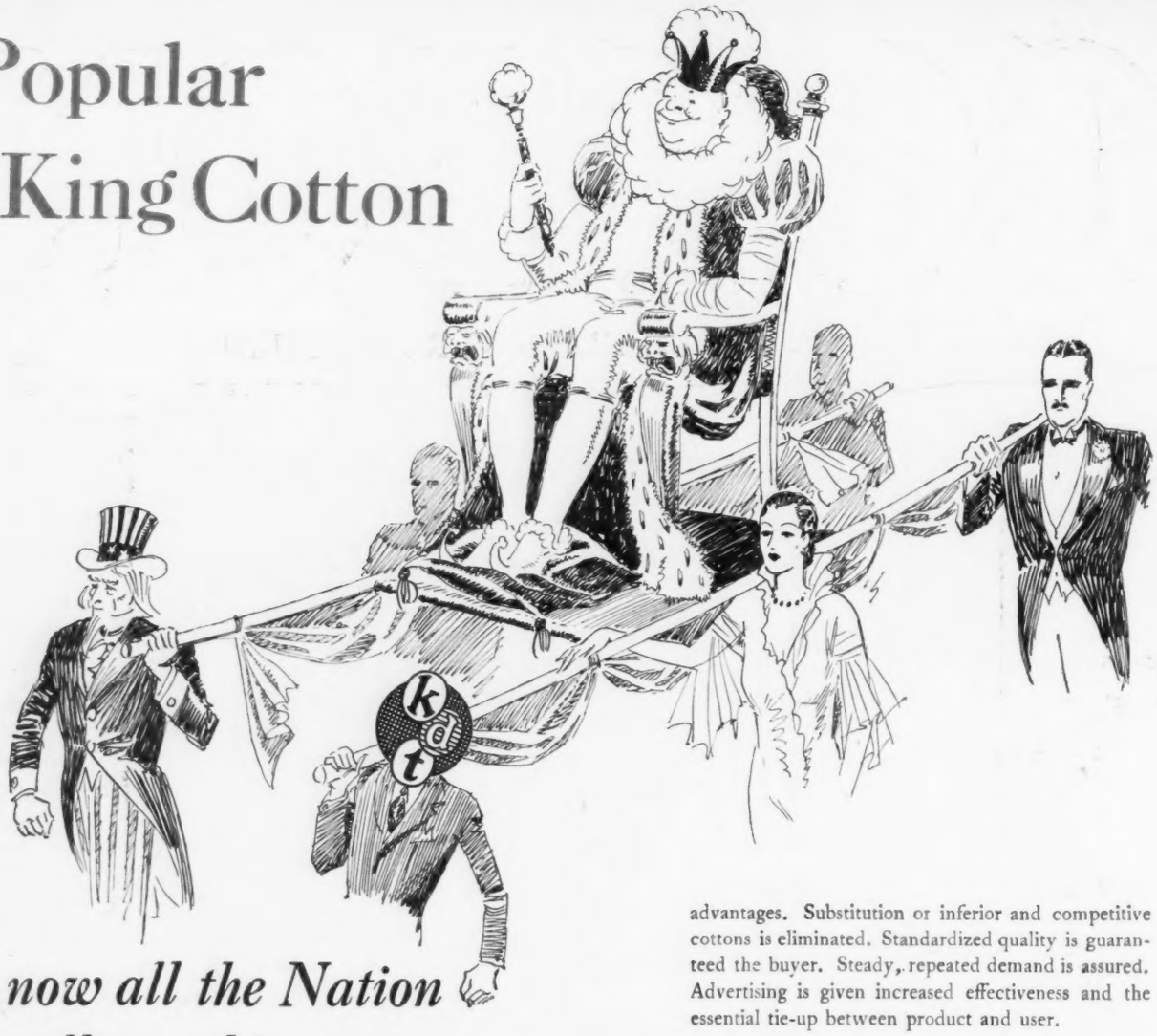

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February, 1931

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ROBERT W. PHILIP, Editor
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COTTON

Vol. 95 February, 1931 No. 4

Heating, Ventilating and Heat Control Equipment for Textile Mills

By Charles E. Doughtie, Jr.
Mgr. Mechanical Engineering Dept.
Robert & Co., Inc., Atlanta, Ga.

A DESCRIPTIVE DISCUSSION of the development of mill heating and ventilating—from the original central fan blast heating, to unit heaters, unit humidifiers, and heat control—

A practical discussion of where these newer developments may be applied in the textile plant—

A discussion of how this equipment should be maintained—

And a peep into the future of developments along these lines.

DURING THE PERIOD of textile development in the South prior to 1900, the modern textile plant of that date was generally equipped with a central fan blast heating and ventilating system. This type of system consisted, essentially, of a large fan which drew air from the outside, through pipe coil blast heaters. Steam under pressure in the coils raised the air to a sufficient temperature to maintain the desired inside condition. After passing through the fan, the heated air was conveyed by large horizontal masonry ducts usually underground to the base of vertical masonry chimneys generally located on one side of the mill and at intervals of approximately one hundred feet. Each vertical chimney had an opening to each floor of the mill. These openings were located approximately eight feet above the floor and discharged the heated air at a velocity of about 2,500 feet per minute.

This type of system gave excellent service when it was properly installed, and until the heating elements began to stop up with scale, sediment, lint, dirt, etc. This system not only heated the mill, but also provided ventilation. However, it was usually very expensive to install, because of the fan room, duct work and chimneys necessary for the equipment and for distribution of the air.

Originally, artificial humidity was obtained by the use of steam pots, atomizers, and sectional atomizing humidifier heads. In some cases, air washers were installed in connection with the fan blast systems and these washers were really the beginning of the modern central station system of air conditioning in textile plants, which is today recognized as the ideal.

Before the development of the modern central station system, engineers began looking for systems which would be less expensive in cost of installation and which would also serve the purpose practically as well as the central fan blast system. As a result, a good many mills began the use of high-pressure pipe coil systems, which were later modified to medium-pressure gravity return systems, and these systems in general, were later further modified to vacuum systems using extremely low pressures for the steam supply.

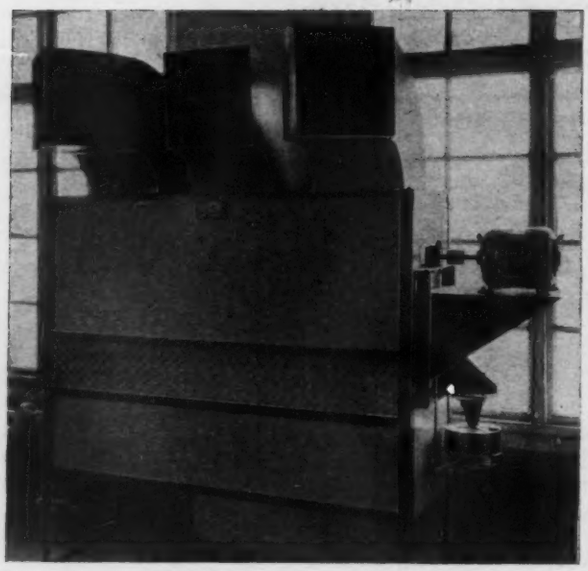
Courtesy, Carrier-York Corp.
Heat diffusing units used in dyehouse to eliminate fog and dripping . . . . . .

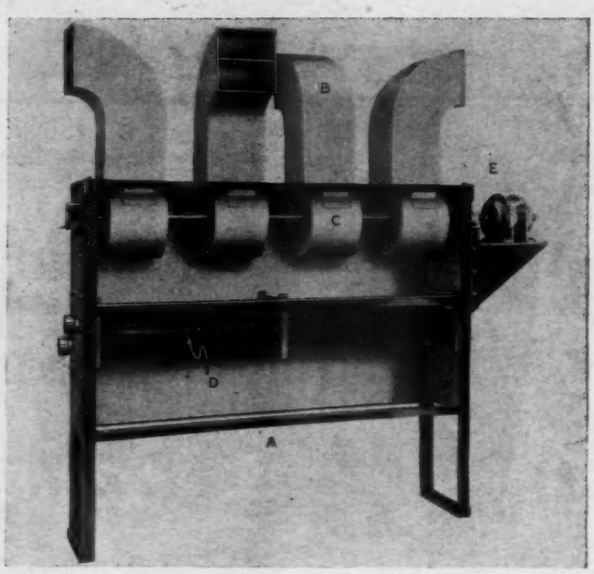
The Unit Heater.

While the average mill heating system was evolving from the expensive central fan blast system to the less expensive pipe coil systems, the humidifying systems were evolving from the steam pot, atomizers or sectional atomizing heads, to the present fan type high-duty humidifier heads.

In the past twelve years there has been a development carried on by a number of manufacturers of an individual fan blast heating unit (unit heater), which would compare in cost of installation with the vacuum type pipe coil heating systems and which would effect a saving in the cost of operation of the heating system, and which would incorporate many advantages of the central fan blast system.

Unit heaters in themselves are very simple in construction, consisting of a metal casing, which





Courtesy, Carrier-York Corp.

Heat diffusing unit installed in a southern spinning room. In the interior view of unit at right, A is the floor level intake; B, the horizontal discharge; C, the housed centrifugal fans; D, the coils; and E, the driving motor . . . . . .

houses the heating elements, disc type or centrifugal type fan or fans, usually motor driven, and outlet ducts or deflectors.

It can be thus seen that the unit heater is essentially a very small central fan blast heating system, with which most mill operators are familiar, except that it permits the elimination of the fan room, masonry ducts and chimneys.

There are two basic types of unit heaters; the blow-through type, generally employing a disc fan mounted in the rear of the heating element and blowing the air through the heating coil, having the propelling motor in the air travel of the unit itself, and the draw-through type unit generally employing a number of housed centrifugal (blower) type fans, mounted on a common shaft and driven by a motor outside of the air travel of the unit. These draw-through type units lend themselves most readily to floor mounting. It has generally been proven that the floor mounted unit heater, either draw-through type or blow-through type with re-circulating box to the floor, is the most efficient and satisfactory, provided the unit is designed to handle the maximum volume of air with the lowest possible final outlet temperature when maintaining the desired room condition.

Quicker Heating-up of Mill.

It is necessary for best operating conditions to have a mill properly heated before the textile machinery is started up, and with a properly designed system of unit heaters it is possible to get heat distributed in a much shorter time than is required by the pipe coil systems. This, of course, is due to the forced circulation created by the motor-driven unit heater fans and the fact that the air is usually re-circulated until the mill is brought up to the proper temperature. With the use of pipe coils, the heat is available, but it takes time for it to become distributed, as it has to gradually build out from the heating coils, since there is very little circulation in the mill until the textile machinery is started.

When the rooms are equipped with high-duty motor-type humidifier heads and these heads are placed in operation when steam is turned into the coils the question of inside circulation and distribution of heat is amply taken care of by the humidifiers.

Heretofore, unit heater systems were considerably higher in cost of installation than pipe coil systems. Since the units have been put into quantity production, however, the price has gradually been reduced until it is nearly in line with pipe coil installations.

Dissipating Fog and Condensation.

One disadvantage of the unit heater system has been the difficulty of keeping the units clean, but the manufacturers have made arrangements on most units whereby it is a very easy matter to clean them satisfactorily. It is still necessary, however, to clean unit heater systems considerably more often than pipe coil systems. The majority of mills are now equipped with air cleaning systems carrying forty to eighty pounds air pressure, and it is a very simple matter, where the unit is arranged for it, to clean it in a very short time, using the high-pressure air. The units can be blown down at the same time the motors in the plant are being cleaned.

In making an installation of unit heaters, care must be exercised in the location of the units so that the outlets can be so arranged as to prevent a direct draft of air blowing on the machinery. Installations have been made where this was not taken into consideration and difficulties have been encountered. If this matter is given proper study, control of the direction of the air current is very simple.

One of the best applications of unit heaters is obtained when applied to remedy certain conditions in textile finishing plants. It has always been a very serious problem to dissipate the foggy condition existing in certain processes of a finishing plant and to eliminate the condensation on the ceiling, and usually every year considerable damage results from condensa-

tion dropping on the goods in process before the operatives are aware of the conditions. The life of the roof planking and overhead piping is considerably prolonged by the elimination of the moisture forming on ceiling and piping.

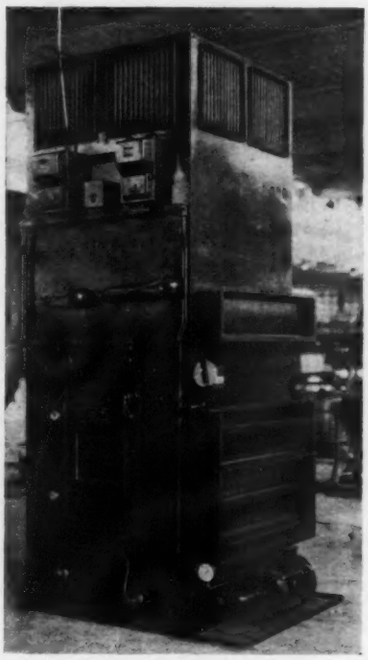
In a number of finishing plants unit heaters have been installed and have served successfully in eliminating fog and drippage; and in preserving the roof structure and piping. It can, of course, be readily seen that a much better working condition can be maintained by the elimination of the fog and condensation.

In this application of unit heaters it is very necessary to introduce from the outside large volumes of relatively low temperature air, not exceeding 100 degrees F. at the point where discharged into the room and providing an exit for this air introduced into the room either through properly designed monitors or by exhaust fans. This outside air in passing through the unit heater is heated and blown into the room with very low relative moisture content and on encountering the moist air in the room it tends to absorb it and in this way eliminates the foggy air and condensation. Care must be exercised to provide a by-pass around the heating elements so that temperature of the air can be controlled in mild weather to prevent over-heating of the rooms.

The Unit Heater-Humidifier.

During all of the various periods of development in heating, the central fan blast systems have been installed from time to time in certain mills, but to these fan blast systems have been added a process of air-washing and humidification of the air being delivered into the mill and this unit is commonly known as the central station. With the central station the attempt was made to have one unit serve all departments in a mill, such as the card room, spinning room, weave room, or twister room, but this was not a complete success because of the greatly varying conditions required. It has now been generally recognized that with the central station system, to get best results, a separate unit should be installed for carding and roving, another unit for spinning, and still another for weaving or twisting.

Certain unit heaters which have been developed in the last few years have also had humidification combined with them—unit humidifiers; and the trend today seems to indicate that in the future it will be well for the mills to give consideration to the installation of combined heating and humidifying units. It appears that not only will there be a saving in installation and operating costs when compared with the cost of the vacuum pipe coil heating system and individual high-duty humidifiers with full automatic temperature and humidity control, but that better ventilation can be obtained. However, this point will probably not be reached in the immediate future, as the system still requires development.



Courtesy, Carrier Engineering Corp.
Unit Humidifier.

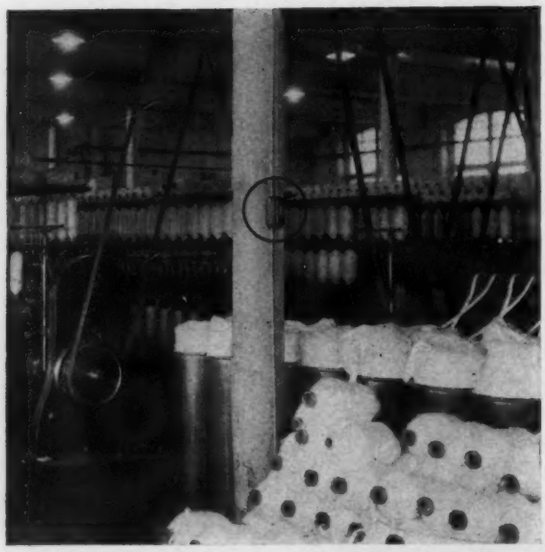
The method of ventilation usually employed by mills having the pipe coil and high duty humidifier head systems is infiltration, or the actual opening of windows or doors. The opener, picker and napper rooms are generally over-ventilated, and most other rooms are under-ventilated.

Problems of Ventilation.

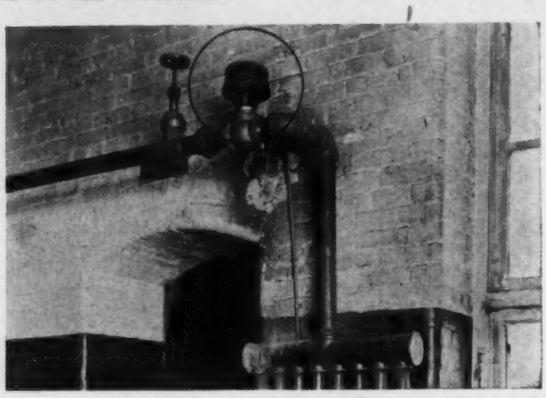
It is generally recognized that if windows and doors can be kept closed better conditions can be maintained, provided the proper equipment is available for affording adequate ventilation. The ventilation of mills by opening windows and doors permits dust, soot and dirt to enter the mills without any control whatever. By proper arrangement of unit humidifiers, practically all dirt, soot, etc., coming into the mill with the ventilating air can be eliminated. For proper removal of soot an air filter of the dry or viscosine type should also be installed.

During the past several years, the horsepower of certain textile machines has gradually increased, due to the increase of spindle speeds, and since there has been a trend, especially in spinning, and twisting, to install individual motors and group them in a motor alley, it has been very hard to devise an economical system which would relieve the intense heat generated in the motor alley. The unit humidifier should lend itself, by the proper adjustment of outlets, to the dissipation of this intense heat, both in summer and winter. In summer the full circulating and humidifying capacity of the unit could be directed to certain points in the motor alley and serve to dissipate the heat, all outside air being used; and in winter the air could be tempered and introduced at a temperature which would tend to dissipate the excess heat in the motor alleys after the room had reached the proper temperature. This system for motor alley heat dissipation has not been developed to a satisfactory point as yet, but it has possibilities and both the manufacturers and engineers are giving it consideration with the view of applying it in the future.

With the pipe coil heating systems and high-duty humidifier systems, which is the usual combination in mills at present, it is possible in summer to reduce the temperature in the various mill departments from five to twelve degrees below outside temperature, depending on outside conditions. This, of course, necessitates opening a number of the windows and doors in the various mill departments and does not give a very good control over humidity conditions, because at one moment there may be absolutely still air conditions existing outside,



and the next moment a five-mile, or better, wind may be blowing.



With the unit heaters, having the humidifier equipment combined, it would be possible to control the exact amount of cooling and to maintain the proper relative humidity throughout. Of course, the unit humidifier can only cool the air as much as the outside air conditions will permit. That is, on a very muggy or rainy day, it would not be of very much benefit because the entering air from outside would probably be saturated or very nearly saturated; but, fortunately, there are very few days of this kind which would need any special cooling effect. It does not appear that de-humidification is justified under present conditions.

Automatic Heat Control.

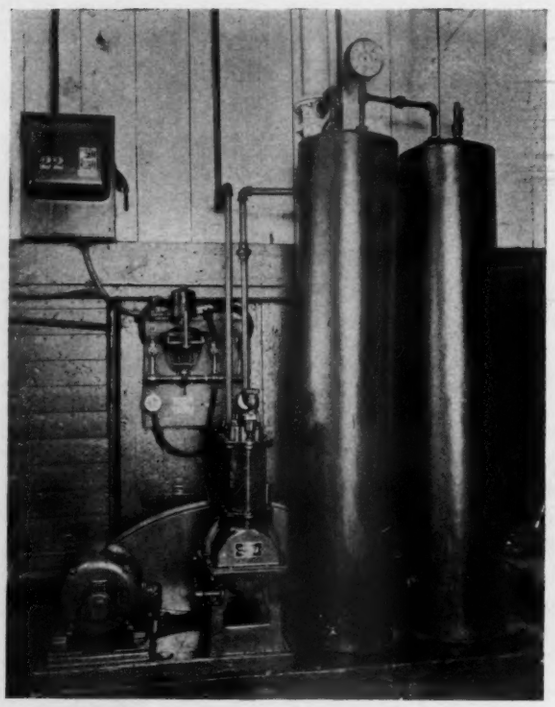
In the last several years, mills have begun to realize that humidification and heat control is a very vital problem, and mills are going into it more and more every day. Only as far back as ten years ago, there were very few mills which had proper humidity control and extremely few who had any heat control. Present day competition has demanded that all conditions in the mill be maintained as near constant as possible, and in order to maintain this properly, it has been necessary to install automatic controls.

Automatic control of heating systems is very simple, the expansion and contraction of metals or fluids being the real basis of the heat control system.

The type of heat control system most generally used in textile plants equipped with pipe coil heating systems consists of three major units. First, the thermostat, which is the expansion and contraction unit equipped with an air control valve; second, the pneumatically operated diaphragm valves for control of the heat supply to the coils; and third, an automatic air compressor for air supply to the control and diaphragm valves. In the central station systems and on unit heaters and unit humidifiers, in addition to the diaphragm valves on the heating elements, there has been added damper control.

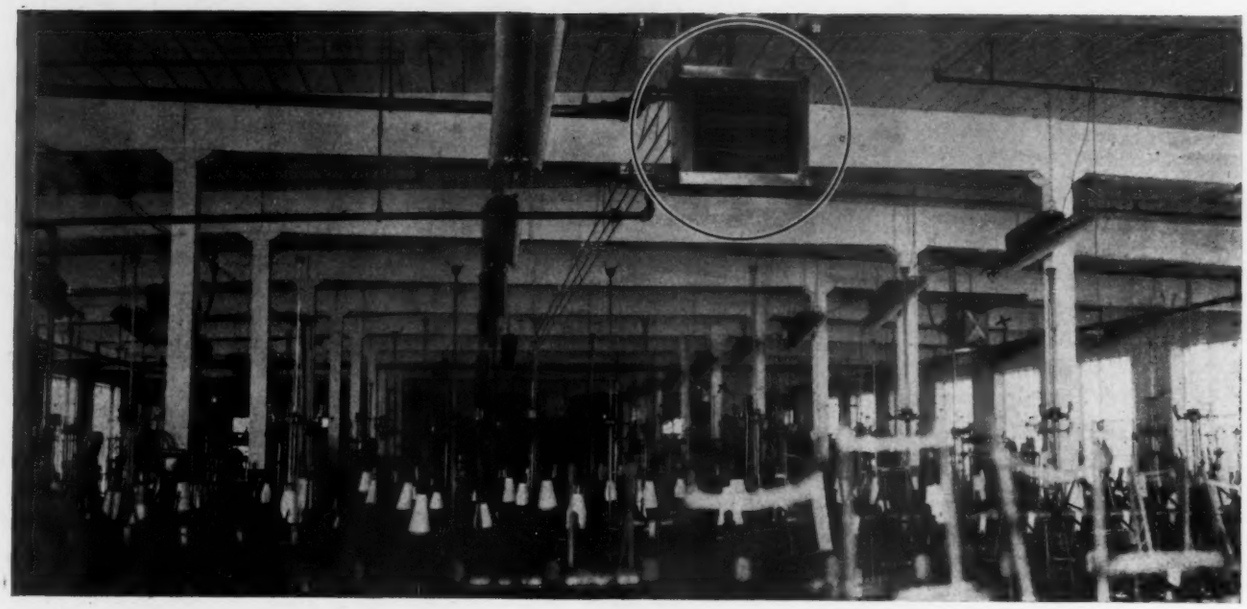
The heat control system really serves two purposes, one is to cut off the heat supply to the coils or to shut off the damper in air ducts, at a pre-determined temperature; and the other is to open up the steam supply or damper when the temperature falls below a pre-determined point. By the proper control of heat the efficiency of the humidifier system is greatly increased naturally due to the fact that the control of humidity is dependent on control of temperatures.

The practice in mill heating when not equipped with automatic control has been for the fireman to fire up and wait until one of the overseers came to the boiler plant, or sent word to the boiler plant, and notified him that the mill was too hot. The chances are that the boiler room operator would turn off the main supply valve, and if all other rooms were not at the proper temperature, they would immediately send word to the boiler room that they did not have enough heat, and that he should turn steam on to the mill, for their benefit, thus generally over-heating the other rooms. Usually after the mill had been brought up to the proper temperature or above, throughout,



Courtesy, Johnson Service Co.

Automatic heat control in a Georgia mill. Top, in circle, the thermostat; center, in circle, the diaphragm control valve; and, bottom, the automatic air compressor for air supply to the control and diaphragm valves . . . . . .



Courtesy, Grinnell Company.

Showing a unit heater installation in a seamless knitting mill.

the boiler room man would shut off the main valve, and the temperature would begin to drop in certain parts of the mill.

Then word would be sent to the boiler room attendant that heat was needed and for him to turn on the steam and the cycle was repeated. This was usually a question of co-operation between the various overseers and the boiler room man, but in certain cases instead of sending to the boiler room, they would cut off the steam supply in the various room coils by manipulation of the coil valves or by closing dampers. Usually this was overlooked, however, until the room was overheated.

With automatic heat control throughout the plant, the fireman maintains a definite pressure at all times and steam is supplied to the mill at this pressure. The automatic thermostatically-operated valves control the steam supply to the various units as needed. For instance, if the spinning room reaches the proper temperature at seven o'clock in the morning, the thermostats in this room would automaticaly shut off the steam supply to the coils and no additional steam heat would be supplied until the temperature in the room had fallen below a pre-determined point set on the thermostat. Carding, roving and weaving usually require heat for a longer period of time than the spinning or twisting, and heat for these rooms would be supplied as long as required automatically by the thermostatically-operated valves. The automatic temperature control does not prevent the rooms from overheating if there is an excess of frictional heat or heat generated from motors, lights, etc., but it will prevent over-heating from the steam heating system.

Due to the fact that radiation in textile mills, be it pipe coil, unit heater, or central station, is distributed in large units, the automatic control of these can be accomplished with a minimum number of thermostats and diaphragm valves. This arrangement makes an automatic temperature control system a desirable investment from a fuel saving standpoint, due to its low cost in textile mills as compared with buildings of other types where the radiation is split up in small units.

Heat control has been perfected to such a point that most of the control manufacturers give a three year service contract, which means that for the first three years it does not cost the mill anything for up-keep. They usually have one of their men call at the mill before the heating season starts and make a brief inspection of the system, and see this is ready for operation. This is one factor which has made the heat control system as successful as it has been.

Care of Equipment.

The heating, ventilating (where installed) and humidifying systems were formerly treated as necessary evils. This attitude has changed in recent years, and more attention is being given to these systems. However, there are some mills who seem to think that they do not require any attention at all, so, consequently, do not try to keep them up in any shape so long as they will work after a fashion.

At the beginning of the heating season, some one thoroughly familiar with the system installed should be designated to have charge of the system and to make a thorough inspection of all moving parts, especially all traps, vacuum pumps, boiler feed pumps, automatic valves, pressure-reducing valves, etc. These should be carefully inspected and cleaned up. All strainers should be removed and cleaned. All worn parts should be replaced. A defective trap can waste considerable steam and prevent the system from working properly. A bad pressure reducing valve can ruin all traps throughout the system. A vacuum pump which is not properly packed will not create the proper vacuum and, of course, reflects back on the coal pile. Dirty strainers prevent condensation from returning properly to the boiler plant.

All textile machinery in the mill is usually checked up rather closely, and the heating and ventilating systems should really be considered as a part of the machinery, and given an inspection equal to that applying to other machinery throughout the plant.

Painting Up the Mill and Village According to a Plan

By H. K. Hallett
General Manager, Kendall Mills

AN INTERESTING account is given here of how the Kendall Mills approached the problem of mill and village painting, as a part of their maintenance program; how they handle it; and the results secured. Mr. Hallett also discusses helpfully the subject of paint in general, and particularly useful are his explanations of how surfaces should be prepared for painting, and how the paint should be applied.
—THE EDITOR.

IN PREVIOUS ISSUES of COTTON, at the request of the editors, we discussed the mechanical aspect of The Kendall Company's maintenance plan. A painting program is another important phase of general maintenance, especially where there are mill villages, with houses and other buildings, as is the case generally in the South. The maintenance aspect of painting—that is, preservation against weather and deterioration—is important, but there also is the factor of appearance which is perhaps the biggest reason for systematic painting. Appearance has definite effects on people. A tumble-down, weather-stained, paintless building or village has decided negative influences on those who see it and live with it. Clean, attractive, neat, well-painted surroundings help make people better citizens and better workers.

Paint in General.

The importance of painting has prompted The Kendall Company to study quite extensively the whole subject of paint, its application and other phases.

For ease of presentation and also of understanding we divide our discussion into the following heads:

1, paint in general; 2, mill painting; 3, village painting; 4, painting crew; 5, costs.

There are two broad classifications of paint—inside and outside. The basis of all outside paints is pigment and vehicle. The vehicle carries the pigment and fills the surface and pores. The pigment seals the surface, preventing quick oxidation. Pigments consist of lead and zinc principally, but others such as lithaphone and titanium oxide are sometimes used. Many paints also have binders or inert material such as asbestine. Vehicle usually consists of raw linseed oil, turpentine and driers. Pigments in inside paint usually are lithaphone and zinc and the vehicle is a specially treated linseed oil which insures against yellowing with age.

Proportions of pigment and vehicle vary. The climate is an important modifying factor which must be studied particularly carefully in the South. The season of year in which the paint is to be applied, conditions of the surface to be painted, the exposure—that is, whether North, South or what—are among other factors affecting the proportions of the paint ingredients.

Oil gives life. The greater the quantity, the greater the penetration and resulting preservative qualities. Too much oil causes the paint to crawl. Lead and zinc are for body and appearance. An excess of lead will cause chalking or dusting. Too much zinc makes the paint hard and causes cracks in the surface.

For several years The Kendall Company has been experimenting with various paint formulas. We test these formulas by applying the paint and studying the result. In the mill we will take a department such as the weaving, where there is comparatively high humidity, and will paint two or three bays using a different paint for each. When the application of paint is finished, each bay will be identified by having stenciled in an inconspicuous place the date applied, the number of coats, and a code number for the particular kind of paint. Each of these factors will then be checked over a period of time to see how the gloss holds up, whether the surface remains white or develops a yellow tinge, and to get other facts.

The paints will also be checked by an outside chemist for quality and nature of ingredients. This type of checking is done at regular intervals on our regular paint

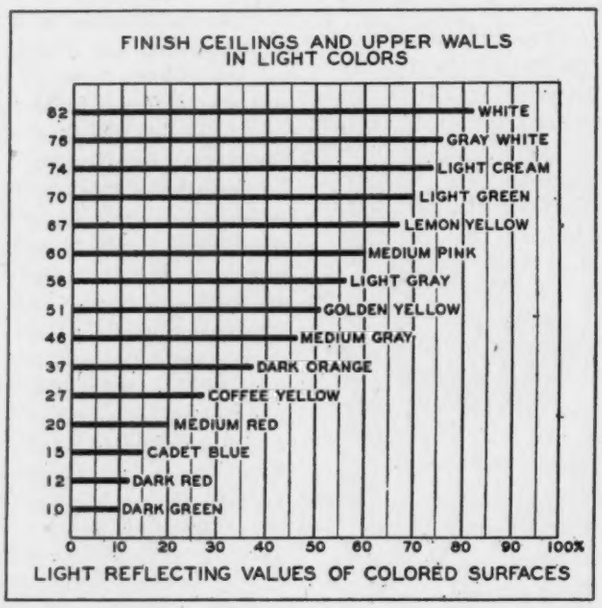


Chart A—Showing Light Reflecting Values of Different Colors

THE KENDALL COMPANY

VILLAGE AND PLANT STANDARDIZATION OF PAINTS AND VARNISHES

PLANTS—EXTERIOR PAINTING

NO.	COLOR	MATERIAL
1	RED	Outside Body Color — Thrift, Temporary Wood End; Walpole Ring Room, Office Annex; Tenter Roll Storage Bldg.—Cotton Dept. Shed.
2	SLATE	Outside Body Color — Walpole, Chemical House; Thrift, Cotton Shed; Waterco, Cotton Shed; Oakland, Temporary Wood End; All Barns, Sheds and all Wooden Outbuildings—all Plants.
3	GREEN	Outside Sash, Trim, Doors and Conductor Pipes — Old Standard for Southern Mills
4	LIGHT LEAD	Outside Trim — New Standard for Southern Mills
5	WHITE	Outside Sash — Slatersville
6	GRAY	Outside Jet and Window Frames — Slatersville
7	BLACK	All Metal Roofs and Fire Escapes
8	BROWN	Kromik Metal Primer — For all Exposed Metal Surfaces except Galvanized Iron
9	SLATE	Galvanized Metal Primer — For all Galvanized Metal
10	BLACK	Metal Smoke-Stacks — Exterior all Metal Smoke-Stacks
11	ALUMINUM	Metal Tanks, Fences, and Fire Escapes
12	BLUE	Auto Truck Bodies
13	CARDINAL RED	Auto Truck Gears
14	BLACK	Auto Truck Fenders and Hoods

VILLAGES—EXTERIOR PAINTING

NO.	COLOR	MATERIAL
100	IVORY	Outside Body Color — All Villages
101	BLACK	Outside Sash Color
102	GREEN	Outside Lattice Foundation
103	GRAY	Porch Floor Paint

VILLAGES—INTERIOR PAINTING

NO.	COLOR	MATERIAL
BA	WHITE	Ceilings — New and Old Plastered Houses
BB	BUFF	Walls — New and Old Plastered Houses
BC	MAHOGANY	Trim — New Plastered Houses
BD	GOLDEN BROWN	Trim — Old Plastered Houses and Ceiled Houses
BE	GRAY	Wall and Ceilings — Ceiled Houses
BF	DARK GRAY	Trim — Ceiled Houses

PLANTS—INTERIOR PAINTING

NO.	COLOR	MATERIAL
A	FLAT WHITE	Galvanized Iron Primer — All Galvanized Iron on Interior of Plants
B	FLAT WHITE	Flat White — First Coat for all Walls, Ceilings and Pipes — Factories, Offices
C	GLOSS WHITE	Gloss White — Finish Coat for all Walls, Ceilings and Pipes — Factories, Offices
D	EGG SHELL WHITE	Eg-Shel White — Finish Coat for Walls, Ceilings and Pipes — Slatersville
E	WHITE	Fume-Resisting White — Finish Coat for Bleacheries, Dry Houses, Slasher Rooms
F	GREEN	Dado Enamel, New Standard, Walpole-Slatersville — Height, 5 Feet
G	DARK OLIVE	Dado Enamel — Old Standard for Walpole
H	LIGHT GRAY	Runways — Overhead Wooden Construction in Bleacheries and Slasher Rooms, including Size Platforms and Slasher Heads — All Plants
I	LIGHT GRAY	Gray Dado for Southern Mills
J	ALUMINUM	For Sealing Purposes and all Radiation
K	WHITE	For all Boiler Rooms
L	SLATE	Hangers for Shafting — All Plants and Motors
M	IVORY	Office Side Walls
N	DRAB	Office Dado — 39 inches high
O	BROWN	Line Color, Offices — 1½ ins. above dado, 3 ins. above floor
P	GOLDEN BROWN	*Pipe Lines — 8-inch band, 1 inch above dado, and fittings only* Pipe Lines — Exhaust Steam
Q	WHITE	Pipe Lines — Steam, High Pressure
R	LIGHT LEAD	Pipe Lines — Pneumatic Line
S	BLUE	Pipe Lines — Fresh Water — Low Pressure, Blue High Pressure, Blue and White
T	CARDINAL RED	Pipe Lines — Sprinkler
U	GREEN	Pipe Lines — Salt Water
V	BLACK	Pipe Lines — Fuel Oil
W	RED & BLACK	Pipe Lines — Electric Lines and Feeders
X	GOLD	Humidifiers

Chart B—The Kendall Mills paint standards specify paints and colors for each type of mill or village job.
(In this chart, because of the impracticability of reproducing it in full color, the names of the colors have necessarily been substituted for the actual color samples.)

as well as on experimental lots. Here is a typical chemist's report on an exterior paint:—

	Percent
Weight per gallon ---------- 14.0 lbs.	
Vehicle (oil), by weight ----------	36.7
Pigment, by weight ----------	63.3
	100.0

Vehicle	
Volatile thinner ----------	6.0
Oil ----------	94.0
	100.0

(The thinner is approximately 20% turpentine and 80% light mineral spirits.)

Pigment	Percent
Total lead calculated as lead oxide----	36.60
Total zinc calculated as zinc oxide----	42.24
Insoluble silicate ---------- (a binder which holds the lead and zinc)	8.94
Sulphur trioxide ----------	5.35
Carbon dioxide ----------	3.96
Iron oxide and alumina ---------- (the last three items are ingredients of the lead and zinc shown as an evidence of purity)	1.36
Undetermined matter ----------	1.55
	100.00

The presence of the sulphur trioxide and carbon dioxide indicates that the lead is present as white lead (basic carbonate) and lead sulphate. The insoluble silicate appears to be clay or some similar inert filler. The small amount of iron oxide and alumina perhaps is from yellow ochre used as a tinting material. The probable composition of the pigment is therefore as follows:

Inert filler ----------	8.94
Ochre (tinting material) ----------	1.36
Lead sulphate ----------	20.26
White lead ----------	25.12
Zinc oxide ----------	42.24
Undetermined pigment ----------	2.08
	100.00

Mill Painting.

Light Reflection. In the artificial lighting of our mills we have followed the latest standards resulting from research in the Edison laboratories. To come up to these standards it has been necessary to relight every mill we have acquired. Efficient dissemination and reflection of light are of equal importance with the relighting. The Chart A illustrates light reflecting values of various colored surfaces.

White, of course, has the greatest value. We will explain further on in this sketch the painting of all

pipe lines in addition to the regular white walls and ceiling in order to get maximum return. The dados at all our mills were originally a dark green with a light reflecting value of only 10 per cent. Its real value seemed to be in hiding dirt. In making a product primarily for the hospital and retail drug trade, cleanliness is of prime importance. In fact, all the operatives in our mills dress in white uniforms. As an aid in stressing this "sanitariness" as well as to increase light reflection, dados are now being painted a light grey.

Application. We make detailed analyses of the surfaces to be covered. A few examples of conditions and suggested procedures will better illustrate the importance of this procedure.

1. RESINS show through in spots on the ceiling. These are scraped, and a blow torch draws out surplus resin to prevent further discoloration. Then the spots are sealed with shellac and spotted with an undercoat paint.

2. GREASE SPOTS show around hangers and pulleys which have formerly not been properly cleaned. To assure a lasting surface, spots are then thoroughly washed with gasoline, then sealed with shellac or aluminum paint.

3. BRICK WALLS. In some mills the brick walls in the past had several applications of cold water paint over which had been applied an enamel or lead and oil paint, the result being that the film of the former had no affinity for the latter and had pulled away to the bare brick in many places. To prevent a recurrence of such a surface condition the bricks are thoroughly scraped with a wire brush and then given a coat of paint having an excess amount of penetrating oil to form a bond. New bricks are treated with a solution of zinc oxide—three pounds of crystals to a gallon of water—to neutralize the lime and prevent burning. After this, two coats of flat and one of enamel are applied. The flat coat is applied thin, reducing with turpentine and using a little varnish oil to get a better bond and to prevent the peeling which is apt to result from a heavy application.

Courtesy, Sherwin-Williams Co.
A well-painted Kendall weave room.

After walls have been properly prepared once it is not necessary to repeat the same amount of detail on the next round of the painting crew.

4. PIPE LINES. Reference has been made to the light reflecting values of different colors. Pipe lines formerly were painted different colors—sprinkler lines a solid red, for example—but to obtain the greatest light value it was decided to paint all pipes white. However, to enable the maintenance crews to identify the different systems, it was necessary to use code colors. The code consists of painting a two-inch band on the main pipe lines just above the dado; elsewhere, fittings only.

By referring to the Standard Color Chart (Chart B) one can see, for illustration, that sprinkler bands and fittings are red; humidifiers bronze; air lines grey; high pressure steam white; fuel oil black; electric conduits black and red; and so on. These colors are those universally adopted by the American Society of Mechanical Engineers and used throughout the country.

Before our present painting program was started many pipes were just as they had come from the factory, with only a coat of black asphalt paint. To carry out the adopted standard color scheme it was necessary to paint these pipes first with aluminum paint to prevent bleeding, then a coat of flat and finally one coat of enamel.

5. FIRE BUCKETS. New fire buckets are washed with copper sulphate (about one pound to every four gallons) then primed with a galvanized iron primer and painted with a coat of flat (tinted red) and then a coat of red enamel.

6. IN DEPARTMENTS where there is considerable humidity, extra precautions are taken to see that the surfaces are *dry* before any painting is done. A weave room for example is scheduled for painting in summer when there is less condensation than in cold weather, or during week ends in cooler weather when the humidifiers can be shut off early the steam kept on to dry the walls and ceiling. The warm weather period of painting likewise applies to outside mill work, especially window sashes where the condensation is unusually heavy in the colder months.

Care of the Finished Paint Job. Care of mill painting after the job is completed is an important requirement although it is often overlooked. To realize the full benefit of light reflection as well as appearance, it is well to bear it in mind. From the light angle, the point can best be illustrated from tests we made when checking up actual foot candles in certain departments before and after cleaning electric light reflectors.

Average of foot candles from ten different positions in the room before reflectors were cleaned was 4.6. The next night, at the same time, with the same voltage reading on the switch-board, these locations again were checked after cleaning, and the average of foot candles was found to have increased to 5.8, or a percentage increase of approximately 26. This experience resulted in the practice of dusting reflectors one week and thoroughly washing them the next. The paint surface, especially around belts and pulleys, is apt to become sticky with dirt and lint. These places are washed, therefore, as necessary with a flax soap solution. The flax soap is used because it is less injurious to a gloss surface than a soap containing lye. The base of flax soap is linseed oil, which has a tendency to build up the surface.

Schedule of Mill Painting. As our painting conditions and studies improve we may change our minds on this point, but right now our experience tells us that the inside of the mill should be painted one coat every five years, except those few places which may need to be touched up more frequently. This takes into consideration cost, lighting efficiency and appearance. The outside of the mill requires one coat every three years to four years.

In the beginning of our paint studies we were not certain as to our ideas on color for mill village houses. Some people in our organization favored a village with all houses the same exterior colors. Others thought four blending shades, used promiscuously, would break up the monotony. To aid in making a decision, one village was painted by one method and another by the other. After a year of observation and inquiry of people in the village it was decided to paint all village houses in the future one color—ivory. It is true there is, in some cases, a rather monotonous appearance, but we are working out a program of tree planting and have found that the green of the trees blends with the ivory color of the houses to make a pleasing combination.

Courtesy, Sherwin-Williams Co.
A corner in a Kendall village.

Mill Village Painting.

On the inside of the houses we experimented in one village by giving the housewives their choice of a range of colors. A majority favored a cheerful, light, warm-appearing buff with wood trimmings in a serviceable darker color. This combination finally was chosen as standard for all houses with plaster walls.

Surface Preparation. The preparation of the surface for house painting is not as arduous as preparing the interior of a mill. Nevertheless, surfaces must be made ready to receive paint, in order to yield the proper results. It will be found necessary in some rooms, particularly the kitchens, to clean the surface with gasoline or soap and water. This necessity also may hold for door facings, around door knobs, etc. It may be found that old plastered walls have previously been painted with a cold water paint which menaces the durability of an oil paint; therefore, as in the mill, this must be removed by wire brushing and by the use of soap and water with a rag or soft brush. The work must be done lightly, so as not to injure the surface.

All outside surfaces should be dry, free from dirt and foreign substances. Loose boards should be fastened and leaks eliminated; otherwise the moisture will cause blistering. This is especially important in the South where much of the wood is highly resinous. As in the mill, resinous spots should be drawn out with a blow torch and afterwards touched up with shellac. When painting exteriors, a few important main points should be borne in mind, then the balance left to the sound judgment of the head painter.

Painting schedules are arranged so that village exteriors can be painted during spring, summer and fall. Even in the early spring and late fall the dew is apt to hurt the surface and leave flat spots. If too cool, turpentine of course is added to make the paint stick.

The southern and western exposures, particularly during our hot summers, should receive more oil when applying paint than the northern and eastern exposures, to get a uniformly lasting job.

When intelligence is mixed with the preparatory work, the interiors and exteriors can go with one coat every three to four years which will give the necessary preservative qualities and the desired appearance.

Working on pre-arranged schedules, with five mills and villages The Kendall Company decided that its own painting crews could handle the painting more easily and more economically. This allows the greatest flexibility. For instance in 1929 we built fifty new houses in one village. The crew was shifted, a few extra men were added and the year's schedule was not materially upset. Also, work can be planned advantageously according to season of year and weather—interiors of mill and village during rainy and cold weather; exteriors during clear and warm weather.

The most efficient way to place the crew is being studied constantly as are other details such as, for example, the best type of scaffolding for the particular type of work both in the mill and village.

1. MILL. At present we use four men to a scaffold because we have found that arrangement handles the work with greater speed and ease than any other combination. While painting, it is essential to have as few interruptions as possible in the regular operation of the mill. Also, work in process must be properly protected. Drop cloths which roll up on wooden rods and which when unrolled on top of the scaffold extend out four feet on each side, have been particularly helpful in respect to cleanliness. With four men working on a scaffold in a department, two others work along on the walls and window sashes.

2. VILLAGE. On the outside of the houses we usually work two men on scaffolds and two men on porches, steps, etc. On the inside, three men work a room at a time, two on the walls, one on trim and sash. Our painters co-operate with the occupants of the houses—making as little confusion as possible in moving furniture, not painting where there is sickness, and so on.

Accurate cost records are kept on labor and material. In the villages, records are on a per room basis, in the mills on a square foot basis. These facts are our guide in making accurate estimates for the yearly painting budget.

Maintaining the Mill's Steam Equipment

From boiler to place of use, maintenance is very essential; air compressors and humidifying equipment are also discussed

By Homer Carter, Superintendent
Pepperell Manufacturing Co.
Opelika, Ala.

EVEN IN THE MILLS that do not generate their own power, steam equipment is necessary for heating and process work. As a general rule very little attention is given by the management to maintaining this equipment, and as long as there is sufficient steam generated by the boilers to supply the slashing equipment and to heat the mill buildings, it is taken for granted that the equipment is being satisfactorily cared for. Frankly, the man who is trying to run his mill economically cannot overlook this part of it—and it doesn't require a great deal of attention, either.

I will give in a brief manner the points which I think should be watched. Starting at the boiler room where the latent energy in the coal is used to generate the steam, we will follow it through the pipes to the heating coils, slashers and other process machines.

The Boiler Room.

I will assume that the fireman has been instructed in one of the prime requisites of the boilers—and that is *safety*. Most mills have periodic inspections by an insurance inspector because they have their boilers covered by liability insurance. Their requirements and regulations prevent the operation of the boilers in an unsafe condition, and carelessness which might otherwise be tolerated.

The following suggestions might be followed for a semi-annual or annual inspection of the boilers:

Be certain that the boiler settings are tight and free from air leaks. The boiler efficiency can be lowered considerably through a leaky setting. When the setting has developed cracks, which allow air to enter, thereby lowering the temperature of the gases of combustion, a remedy should be found. A very good and inexpensive remedy is to point up the brickwork with a plastic fireproof mixture. The entire setting might be covered with a coat of air-tight material, which can be bought at a comparatively low price.

See that the fire walls and baffling are in good condition. Unless these items are kept in their original form the gases cannot follow their proper path.

Check the grates and be sure that they are not allowing good coal to fall into the pit, or that they are not closed up to such an extent that they will not allow sufficient air to come through.

See that the heating surfaces have been kept free of scale, oil and soot. The efficiency of a dirty boiler is considerably lower than that of one which is kept free of all accumulations. The scale formation on the inside of a boiler can be cleaned out and corrected by properly treating the feed water, whereas the soot which collects on the outside of the heating surface is something that requires constant and careful attention. The fireman should be provided with equipment to keep the flues free from soot; this cleaning should be done frequently and regularly.

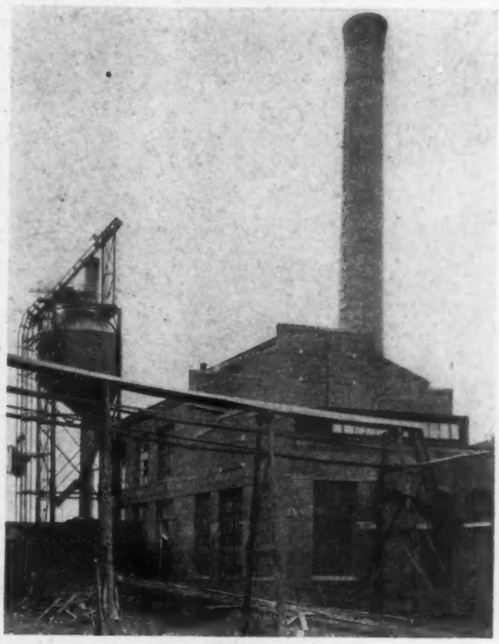
The fireman should be instructed as to the proper method of firing the boilers. The fires should be kept level and free of holes, they should not be so thin that they will allow too much air to come through, nor so thick that they will not allow sufficient draft to enable complete combustion. The master mechanic or superintendent can tell if the fireman knows his business by looking at the fires in the boilers when making the regular daily inspection tour. The safety-valve should not be allowed to pop-off continually; when it does it indicates that there is an excess amount of steam being generated and fuel being wasted. The fireman should be trained to use the dampers to regulate the draft. Improper draft will cause a waste of the combustible gases and will naturally decrease the efficiency of the boiler. A good fireman can save the mill a lot of money by being able to get the most out of the fuel furnished him.

The use of mechanical stokers has become very popular during recent years, but the writer thinks that the size of the plant governs the advisability of installing such equipment. Naturally, where only one fireman is necessary mechanical stokers would not offer a saving in labor, but they might increase the efficiency by affording better firing, and thus warrant their installation.

Most mills in the South use bituminous coal in the boilers due to their proximity to the soft coal mines. The grade of coal used by each plant should be governed by the type of equipment in which it is to be used, and by tests which will show which is the most economical. About the simplest test that can be made by a mill is to check the pounds of water evaporated per pound of coal fired. This may be done by allowing the water from the condensation pipes to flow into a container with a known volume, and only the water in this container used to feed the boilers. The coal used can be easily weighed on some portable scales. Comparative tests like this on different kinds of coal will give an idea as to which coal is giving the best evaporation. It is also a good idea to have a sample of the coal which has been adopted, and properly contracted for, analyzed occasionally by a chemist. Such analyses will show whether or not the coal furnished is uniform in content of B.t.u. value, ash or other ingredients.

The other equipment in the boiler rooms of small plants generally consists of boiler feed pumps and vacuum pumps for the return pipes. The feed pumps should be run at speeds which will supply water to the boilers constantly, and, as nearly as possible, at a

rate equal to the evaporation. The condensation from the heating system, the slashers and other equipment, should be returned to the boiler room to a receiver which should be piped to the boiler feed pump. The temperature of the water fed to the boilers governs the amount of coal needed to evaporate it, and for this reason it is best to utilize the heat in this water. There is less strain on a boiler when water of a comparatively high and uniform temperature is fed in than when cold water is used. For this reason the amount of cold water needed to supplement that furnished by the condensation should be fed into the receiver constantly in order to maintain a fairly even temperature for the feed water.



Courtesy, J. E. Sirrine & Co.
Exterior of a southern textile power plant.

As the boiler room is in most cases located a short distance from the other buildings, it is necessary to pipe the steam to them overhead or underground. In either event it is economical to have the pipes covered with good insulating materials. A good pipe covering will probably save 75 per cent or more of the loss of heat which takes place from naked pipes.

The steam mains should have sufficient traps connected to them to take out most of the condensation which collects before the steam reaches its destination. Otherwise, there may be enough condensate in the steam to cause pounding and water hammer.

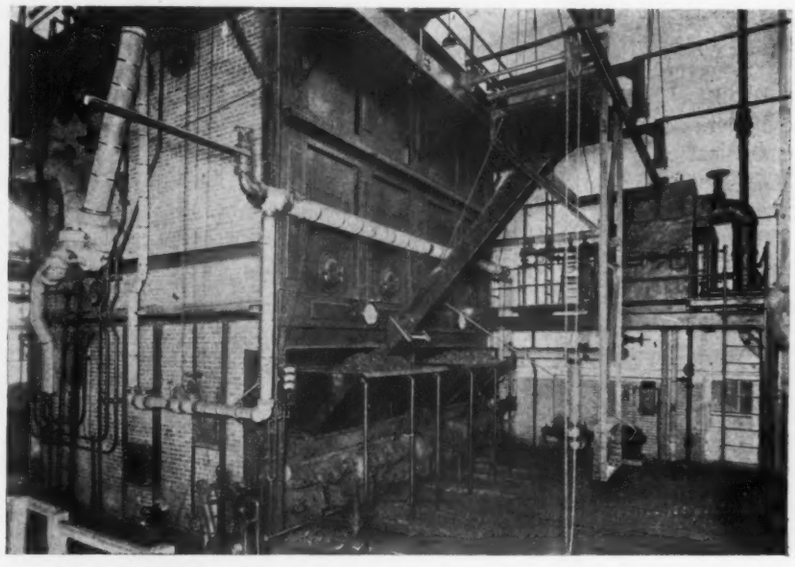
The heating coils are generally designed to take steam at low pressure. It is therefore necessary to have a reducing valve in the steam main which will reduce the boiler pressure to that required by the heating system. This valve should be checked regularly. This may be done by having pressure gauges in the secondary line. I know of one mill that failed to check the steam pressure in their heating system until they found that the low pressure traps in the system were not functioning. On more careful checking they found that the reducing valve had been wide open for several months, thereby allowing most of the boiler pressure to be on the heating system. The small traps were not designed for the high pressure, and were damaged to such an extent that the cost of repairing them was very high. The cost of repairing the traps was not the only loss; the efficiency of the heating system had been low during the time they were not operating.

Quite a few mills have found the use of thermostatic controls for the heating system to be practical and economical aids to efficient management. These controls regulate the room temperature, and in most cases afford a more uniform temperature than can possibly be maintained by hand control. Regardless of how the temperatures of the rooms are controlled, during the months it is necessary to operate the heating system some one man in every plant should be delegated to check them. Unless this policy is followed steam will be wasted by having some coils working when the heat is not needed, and this causes bad working conditions in a plant, as too much heat is worse than not enough heat in a plant.

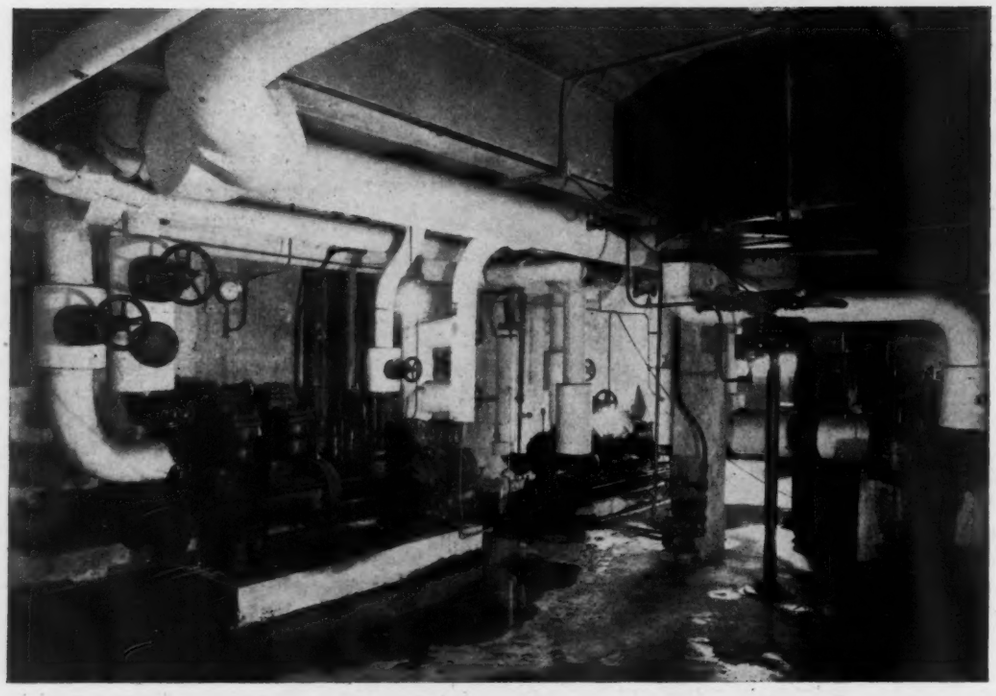
Too much stress cannot be laid on the necessity of repairing any leaks that develop in the steam lines. Several tons of coal can be wasted in generating the steam that can escape through a quarter-inch hole in a very short period.

When it is not possible for the condensation which forms in the heating system to flow back to the boiler room through gravitational fall, traps or vacuum pumps should be provided to return this water. As previously mentioned, this water may be fed back into the boiler, and because of its temperature will require less coal to be evaporated than raw water requires. In only a few cases is it more economical to waste this condensate than to provide means to re-use it.

The lines to the slashers should be designed to carry a higher pressure than the heating system. As a general rule, these lines are connected direct to the



Courtesy, J. E. Sirrine & Co.
Interior of another southern textile power plant.



A portion of the piping in a southern finishing plant.

Courtesy, Lockwood, Greene Engineers

boiler headers, and the steam pressure is not reduced until it reaches the lines feeding the individual sets of slasher cylinders. The amount of condensation which forms in these cylinders is large, and should by all means be returned to the boilers. The steam lines, and the return lines to and from the slashers, should be well insulated, because, as has been explained, the loss in radiation from a naked pipe will more than pay for the cost of installation within a period of a few months.

The purpose of the slashers, as everyone knows, is to prepare the warp yarn for the weaving. Even if the best ingredients are used in the size mix, it is possible to fail to accomplish the best results on the slashers, due to the cylinders not drying the yarn properly. In order to obtain the highest efficiency from the cylinders it is necessary that the driest steam possible be furnished them. This is accomplished by having the steam lines well insulated, and the use of individual traps on each slasher. These traps should be placed in the lines as near as possible to the connections to the cylinders and size box in order to take out all of the condensation which may have collected in the steam. It is just as important that the proper equipment be provided to drain the cylinders as fast as the condensation collects in them. The buckets should be kept in good condition, and traps provided to remove the water as fast as it is poured out of the cylinders. Sight glasses should be installed in each drain so anyone can tell when the water is not being discharged properly.

It is essential that comparatively dry steam be used for the coils in the size boxes, because these coils are usually open, and wet steam would dilute the size. Some mills have seen fit to cover all of the steam pipes in the slasher room, also the slasher cylinder heads, with asbestos material. No doubt it could be easily proven that the expense of this material is negligible as compared to the saving effected. The same rules apply to the kettles in which the size is cooked: they should be covered, and where open steam coils are used small individual traps will pay.

Temperature controlling instruments for the size cooking and storage kettles, the size boxes, and the slasher cylinders, might be discussed at length. However, I think that there are very few mills which have made exhaustive tests in an effort to determine the advisability of purchasing such equipment that haven't bought it.

Summing up, one should endeavor to prevent losses in his plant through steam leaks, radiation losses, etc., by properly maintaining his steam equipment just as he would endeavor to prevent losses in any of the productive departments of the mill.

Air Compressors.

A great many mills use compressed air for cleaning off their machines, and for humidifying atomizers. It is very essential that the air used for these purposes be as free as possible from oil and water. To accomplish this, one good man should be delegated to look after the compressors; a good grade of cylinder oil must be used; a clean supply of air should be afforded (to get this it is sometimes necessary to use an air filter); occasionally separators are installed in the air lines to help remove the oil and water. Some of the oil and water which gets into the receiving tanks can be blown out by the use of blow-off valves placed at their lowest point.

It is very essential that cylinders of the compressors be kept cool. This is done by passing cool water through the jackets around the cylinder walls. I know of one mill that has several comparatively large compressors; they use several million gallons of water every month to keep these compressors cool, and for quite a while this water was wasted. Someone suggested using the water, after it had served the purpose of cooling the compressors, for the humidifiers and the conditioning room. This was found to be practical,

and as a result the mill is saving, or rather has prevented the loss of, over $200 a month, the price of the water which was being wasted.

Air leaks are expensive because compressed air cannot be made cheaply, and for this reason the condition of the valves and connections in the air lines should be checked regularly. A paste made of litharge and glycerine may be used for making the pipe joints tight. Most mills have different ideas about the type of hose and nozzles to use. The size of the equipment has to be governed by the pressure afforded, and the type of cleaning which is to be done. Ordinarily, where air is used throughout the mill, the weaving department requires the greatest pressure because of the nature of the accumulation of dirt on the machines. I have found that it is good practice to buy the best grade of hose, and let the overseers delegate someone to be responsible for the proper care of it.

Humidifying Equipment.

Some mills let each department head share the responsibility of maintaining the humidifying equipment. Others think it best to let the man in charge of the mechanical department be solely responsible. I think the latter arrangement is the better of the two.

Every mill has to determine the per cent of relative humidity which it wishes to be maintained in the various departments. Then the main objective is to maintain conditions as nearly as possible that will approach these standards. Much improvement has been made in recent years in automatic equipment for regulating the humidity, but constant attention to the individual humidifying heads is necessary even with the best and most complete equipment.

Ordinarily, one or more men, depending on the size of the plant and the amount of equipment used, are employed to maintain and look after the humidifying equipment. Schedules should be given these men for carrying out their work. The greatest part of their time will be required in keeping the individual heads clean, as it is very important that they be kept as free as possible from accumulations of lint and dirt. Some mills like to keep the heads polished brightly, and this may be accomplished by the use of some kind of metal polish. The condition of the feed pumps and filter beds should be checked several times every day. The men should also have sufficient time to watch the operation of the heads and to adjust any heads which wet down or fail to give out enough water.

I do not think anyone except the regular humidifier men should be allowed to tamper with the heads. In the event a head is found to be wetting down, it is permissible to let the nearest operative cut the water completely off, but adjustments should be made only by a man who has been trained to do this kind of work. Some mills use the system of having the second-hands in the various departments hang a tag on the heads which are found to be out of adjustment. This tag can be easily seen by the fixer, and he doesn't have to waste too much time in looking for heads which are out of order. The motors on individual heads should be cleaned thoroughly about once a year. Most of them have closed type bearings, and it is necessary to disassemble them in order to clean them thoroughly. Carbon tetra-chloride liquid is a good substance to use in cleaning these motors.

Most plants provide means to heat the water used by the humidifiers during the winter months. The temperature of the water can be controlled by the use of automatic equipment to advantage. It is advantageous to maintain the temperature of this water at an average room temperature. This prevents an additional load on the heating system, and also prevents condensate forming on the pipes which might drop onto the machines.

INSTITUTE COST MANUAL FOR COTTON YARN MILLS.

The Cotton-Textile Institute is distributing a Cost Manual entitled "Determining Cost in Cotton Yarn Mills." This manual has been prepared by the cost section of the Cotton-Textile Institute after long study of opinions and practices in respect to cost procedure in the industry, and, it is believed by the Institute that it represents a demonstration of the best composite thought and experience available regarding this subject.

The manual takes an imaginary mill with a given list of machinery, payroll, and variety of production, and shows every detail of the analysis of this basic information and of the final development of individual cost on each variety of yarn which the mill is assumed to be producing. Copies of this document, it is stated by Sydney P. Munroe, manager of the Cost Section, are being distributed gratuitously by the Institute to all cotton mills in the country, whether yarn mills or cloth mills, and whether members or non-members of the Institute. It is intended that the Manual shall serve as a guide for the eventual establishment of uniform methods in cost finding among cotton yarn mills.

Of special interest is the fact that this cost manual is composed entirely of cotton fabric, the durability of this material being considerably greater than that of paper.

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COTTON IN HIGHWAY CONSTRUCTION.

Further evidence of the international interest attracted to the use of cotton fabrics in highway construction and improvement in this country is indicated from advices recently received by George A. Sloan, president of the Cotton-Textile Institute, from the British Embassy in Washington.

Several months ago the Institute's New Uses Section, which has been continuously studying the results of installations made in South Carolina and Texas, forwarded to the Embassy samples of the cloths that were especially developed for this purpose, along with construction specifications requested.

It is now announced that the British Ministry of Transport is making arrangements for a test of cotton fabric as a clevage plane in concrete road construction. In addition the Borough engineer of Burnley in Lancashire has recently undertaken an experiment on similar lines to those carried out in South Carolina, utilizing cotton fabric in the surface dressing of a water bound macadam road.

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CROWN NEWS STEPS OUT.

It was recently announced that the new year will find the Viscose Company offering its "Crown News" monthly in a new dress and in enlarged size. Beginning with the January issue of this publication, which dealt primarily with developments connected with the Viscose Company's quality-control plan, it was to be extended to an eight page booklet with four color cover and a materially dressier appearance, from the standpoint of paper, printing and illustrations. Miss Christine Ray was also announced as editor of the publication.

Finishing Plant Maintenance Methods

Successful methods in the various operations: the duties of the mechanical department: the importance of accurate estimating and cost figuring on every job

By Paul A. Merriam
Chief Engineer, U. S. Finishing Company: Chairman, Textile Division, American Society of Mechanical Engineers.

IN GENERAL, the chief problem of maintenance in a finishing plant is to keep the plant up and expenses down. This makes a real engineering job out of maintenance, and most finishing plants recognize this by having the maintenance work an essential part of the plant engineering organization. The master mechanic should work with or under the plant engineer; or in small plants the master mechanic should be the plant engineer.

The job of plant engineer in a finishing plant is a most comprehensive one. He should have oversight of power, steam and water; he should supervise new construction and installation; he should devise new layouts, be consulted on production problems, and last, but not least, should supervise the maintenance of the entire property. This article will deal with some of the elements in connection with maintenance and will indicate a few methods that have been used with more or less success.

Determining How to Do the Job.

Before getting into details it should be pointed out that in order to maintain a finishing plant efficiently, there is required a certain amount of office and clerical work. In the first place, draftsmen are needed to lay out work in advance in order to avoid waste labor and material in doing the work, and in order to make sure that the management gets what is wanted. Frequently, by laying out work in advance, the job can be put out for bids by outside contractors and a great deal of money saved over doing the job "at home" by trial and error or by paying outsiders cost plus.

In the small plant, the engineer is frequently his own draftsman. In large plants engaged in considerable new work, several draftsmen are sometimes needed. Of necessity the various machines in a finishing plant have to be re-built, re-arranged, re-located and so forth, as well as repaired. All this work is akin to maintenance. It involves building changes, heavy piping, wiring, millwrighting, masonry, sheet metal work and all the other mechanical trades, and such work must be laid out in advance and such jobs must be organized if costs are to be kept down.

In the second place therefore, it follows that a cost system is needed. Each job should be requisitioned in writing by the foreman requiring the work, and this requisition should, except in minor cases, have the okeh of the plant manager. When thus approved, a job order should be made out and every bit of labor and material used in doing this job should be charged to it. As soon as the job is done, a statement of what it has cost should be made available for the manager and for the foreman.

A very simple cost system such as this will work wonders in reducing the cost of repairs. In the first place, the manager has control of what is done. If necessary he can call for an estimate on the job from the plant engineer before he gives his okeh. In the second place, the maintenance department realizes that every bit of labor and material is to be accounted for, and that if the job appears to cost too much they will have to answer for it, and in the third place, the foremen, when they realize what jobs actually cost and see their department charged for the jobs, are going to think twice before they call for jobs, and are going to do all in their power to prevent repairs being needed.

Maintenance Overhead Must Be Figured.

It is also necessary to account for all the maintenance department overhead expenses. These expenses include salaries, space rental charges, light, heat and power, sundries, repairs to repair shop equipment, and labor charges that cannot be directly charged to regular jobs. These various overhead charges should be scrutinized most carefully by the head of the engineering organization, since it generally appears that worthwhile savings can be made. It is a good plan to charge out the totals of this repair department overhead to all regular jobs pro-rated on the basis of direct labor. In this way the entire cost of each job is available and fair comparisons can be made between doing certain jobs in one's own plant or having them done outside. Where overhead is not considered, a plant may frequently think it is saving money by doing jobs "at home" that could be done cheaper outside, and on the other hand, by careful management assisted by accurate costs, some jobs can be done cheaper at the plant than by the lowest outside bidder.

Another advantage that results from a maintenance department cost system is the accumulation of data that will assist in estimating similar jobs in the future, and that can be used for comparative purposes when the same job again comes into the shop.

In establishing a system for this purpose care should be used to make it just as simple as possible. Unnecessary "red tape" must be avoided. The small amount that is necessary, however, is very much worth-while, and a maintenance organization cannot function efficiently in a finishing plant without it.

One of the accompanying illustrations shows the engineering department of a good-sized finishing organization. In this office are located the plant engineer, the master mechanic, draftsmen and clerks as needed. All plans are prepared and filed here. All

Interior of Engineering Department Office

details regarding the job order or cost system are kept here, also mechanical department time cards, and mechanical department inventory records, and the requisitioning of mechanical material and the passing of invoices and so forth is done here.

Shops Should Be Conveniently Located.

Another illustration shows the machine shop of a finishing plant. This shop should be located in a central part of the plant and on the ground floor. The engineering office and the other auxiliary shops should all be adjacent to the machine shop. It frequently happens in old established finishing plants that these various shops have been placed wherever there was room, and are located all over the plant instead of at one central, convenient location. Thus the carpenter shop might be at one place, the blacksmith shop at another, paint shop somewhere else, and so on. The ideal arrangement is to have machine shop, pipe shop and forge, carpenter shop, paint shop, belt fixer, tinsmith and electricians all in one large room separated by wire partitions if necessary, and a single, central mechanical stock and tool room accessible to all of this group. This results in great economy in oversight, reduction in inventory, and in general greater efficiency in the conduct of the work.

The power and lights for this group of shops should preferably be from outside lines. The cost of such power is small, and by being independent of the plant's own power supply, week-end and overtime jobs can be done without running the main power units of the plant.

Machine Shop Equipment.

Some of the more important items of equipment needed in this group of shops are as follows:

In *Machine Shop, Pipe Shop and Forge*: Boring mill, gear cutter, small planer, shaper, Universal milling machine, lathes of various sizes, radial drill, upright drill, sensitive drill, power saw, hydraulic press for calender rolls, tool grinder, emery wheel, arbor press, pipe-threading machine, forge, etc. welding equipment, and benches, vises, portable tools, etc.

In *Carpenter Shop, Belt, Paint and Tinsmiths' Shops*: Rip saw, cut-off saw, buzz planer, band saw, drill, lathe, saw grinder, pattern maker's lathe, belt clamps, etc., complete sheet metal equipment, benches, vises, glue pot, etc.

Personnel of Mechanical Department.

The personnel of the mechanical department should contain representatives of the following trades: machinists, millwrights, blacksmiths, pipe fitters, masons, carpenters, pattern makers, tinsmiths, painters, belt fixers, electricians and laborers. In the small plant several of these classifications will be combined in single individuals, of course, and in locations where diversified outside shops are readily available it frequently happens that it is economy to go outside for certain specialists when needed, rather than to have them constantly on the pay-roll.

The quality of the personnel of the maintenance department means everything to its success. To build up a force of thoroughly competent men well acquainted with the details of the plant should be the aim of every finishing plant master mechanic.

"Departmental Mechanics."

Before proceeding to discuss the maintenance problems in the various manufacturing departments, mention should be made of a group known as departmental mechanics, which have in various plants justified their existence by reduced repairs. These men are assigned certain departments or groups of departments, and their job is to keep the machinery running in these departments. In the average plant about one-quarter of the mechanical force would be thus assigned. These men of necessity must be carefully selected for their resourcefulness, and ability to anticipate trouble. They are responsible for the lubrication of all the machinery in their assignment. This arrangement alone saves thousands of dollars, because most repair work on machinery comes from lack of lubrication. Furthermore, they must do all minor repairs called for within the limit of their ability. Though operating in locations scattered throughout the plant (all with their own small benches wherever most convenient) they are still directly responsible to the master mechanic.

The author of this article, as vice chairman of the textile division of the American Society of Mechanical Engineers, was co-author of the progress report of that body covering developments in textiles during 1930. . . . . .

The foremen of the departments which they cover can come to them direct with requests for work to be done, but the method of doing it is entirely up to the mechanical department under the master mechanic. This group of men constitute a most valuable inspection service, and major break-downs are anticipated and lost machine time is reduced to a minimum.

Maintenance in the Singe Room.

In the singe room one of the major maintenance expenses has been the renewal of copper single plates and repairs to the furnaces below these plates. This job usually required week-end work. Fortunately, the day of this type of singer is passing and the modern rotary plate singer is doing away with considerable maintenance expense in this department.

In the Bleach-house.

The present-day difficulty in securing good maple logs is bringing about a change in bleach-house maintenance. Formerly, most plants kept a pond full of maple logs or maple rolls and a frequent job in the shop was turning down a worn roll or making a new roll. Now most plants either buy ready-made maple rolls or use rubber-covered iron rolls.

In the Mercerizing Department.

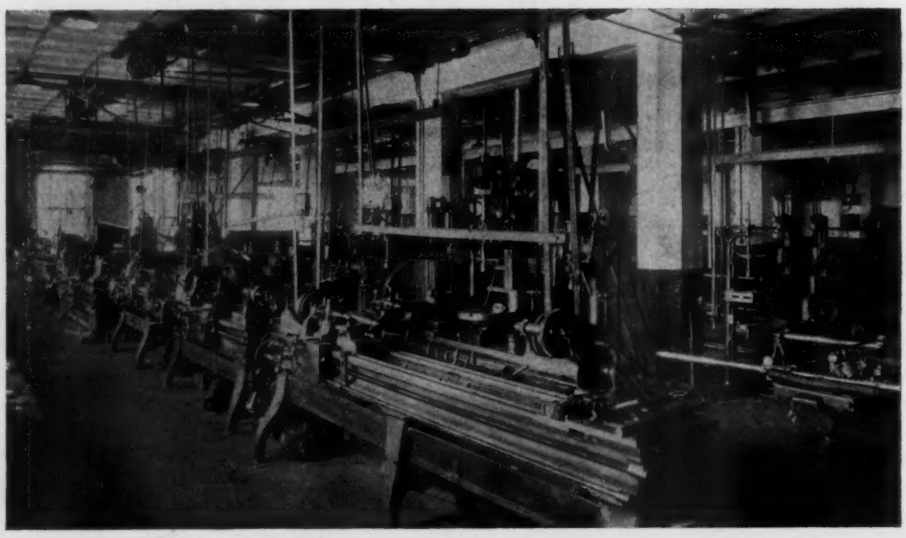
In the mercerizing department there is usually a large assortment of tanks for preparing caustic and storing it in various strengths. This also involves much piping, pumps and kindred equipment, especially if a caustic recovery plant is in use. All of this means careful watching for leaks and prompt repairs, when found. It is needless to say that brass parts have no place in a mercerizing department. The proper condition of the mercerizing chains and the correct alignment of nips and immersion rolls are essential to the production of good work. A frequent cause for repairs and adjustment is the transmission used in synchronizing the padder, frame and washer. Motor range drives have been used here, successfully reducing this maintenance and at the same time giving better synchronism. Such motors and controller should, of course, be totally enclosed or at least specially impregnated.

Next comes the white drying room where we encounter dry cans for the first time. At best dry cans are a source of much repair expense. It is essential that dry cans be rigidly set up and properly aligned. This will mean much in increasing the life of the packings, which should be a good grade of oval gum core steam packing. The traps and drainage piping should be correct for removing moisture without fail. Operating cans full of water not only impairs production but increases the load and the wear on the machine. If reducing valves are used ahead of the cans, they should be kept in proper operating condition and the vacuum breaking valves on all cans should be tried from time to time so as to be sure that they are operative, thus reducing the possibility of collapsing cans. A great deal of attention should be given to the lubrication of the can journals. Too much lubricant on cans is most disastrous since it will quickly make itself evident on many yards of white goods. Compression grease cups using a grease which will not melt too easily, or wick oilers employing cylinder oil, are two satisfactory solutions for this problem.

The Drying Equipment.

The foregoing remarks apply to dry cans wherever located throughout the plant. Another matter relating to dry cans is the question of housing. It is advisable to enclose at least partially every set of cans in the plant and to provide some means for exhausting the moisture which is caught in this enclosure. This will reduce greatly the free moisture throughout the plant and will result in fewer sweating ceilings which hasten the action of dry rot and which would lead to heavy maintenance expense when it becomes necessary to replace roof or floor planking. These housings should be provided with removable or hinged sections so that the cans are readily accessible.

In a properly equipped plant machine shop proper-



Machine Shop of a Finishing Plant

ly managed, all the wearing parts of a set of dry cans can be made at the plant cheaper than they can be bought. This, of course, includes the overhead expense properly distributed on the basis of direct labor. The parts in question are the gears, the dollies, and the renewable journals.

The Print Room.

We will pass by the winding room as not of sufficient importance from a maintenance standpoint to call for special mention. In the print room we find that departmental mechanics are of especial value in keeping track of wearing parts. Here again are a number of replacement parts which can be made cheaper in the shop than they can be purchased. This applies to main drive pinions, fitting gear assemblies, mandrels, color boxes, and so forth. These parts should be made up in lots of several at a time and carried in mechanical stock until needed. Agers call for no special mention except to state that ball bearings for all rolls will greatly reduce maintenance, since the rolls will remain in alignment indefinitely with ball bearings, whereas, with ordinary bearings the journals wear down rapidly and unevenly with the result that rolls get out of line and the cloth runs poorly.

Open soapers and all open width compartment machines require careful alignment of rolls. Anti-friction bearings help here. If they are not available the bearings should be readily renewable and should be constructed of materials as resistant as possible to the baths in which they run. Hard rubber, Micarta, Duriron, Monel, wood and various other materials are used in these locations. Each application should employ the material best suited to it.

Similarly various materials are used for the different immersion rolls. Brass pipe or tubing is most frequently used. Iron has its own special applications, and sometimes Monel or some of the recently developed special alloys are required, and it is occasionally found best to rubber-cover some of these rolls. Each application should be carefully considered and the material used which is cheapest in the long run. Here again, in the manufacture of these small pipe or tube rolls, is a job in which the outside shop should not be able to compete with the plant's own shop.

The Dyeing Equipment.

These remarks relative to immersion rolls and bearings apply equally well in the dye-house in the case of jigs, padders and continuous machines. While in the dye-house, mention might be made of the need for valves of the best quality. For example, the dye jig will have hot and cold water valves and a steam valve. These valves are in constant use, i.e., they are opened and closed many times daily. It is necessary that they be kept tight and it is disastrous to have to be repairing them from day to day. In this location, and in similar ones, therefore, the best valve and not the cheapest in price is the one to use.

In the case of padders or other machines employing rubber-covered nip rolls, it is best if possible to use a lever set in preference to a dead set. Some dyers insist on the dead set, but it has been demonstrated time and again that rubber coverings will not stand up under dead set as long as with the lever set.

In the finishing department ordinary steel tanks are perfectly satisfactory for starch solutions, and they are much longer lived than cypress tanks for the same purpose. The use of layers of yarn wound on the wooden starch mangle bole similar bole similar to what is used on slasher rolls will save a great deal of repair expense by maintaining proper roll surfaces for longer time between re-facing.

Much care should be given to the lubrication of the tenter frame and chain. Lack of oil on the chain rivets will very quickly mean a major repair job. Tenter housings should be constructed preferably of metal in order to save the heavy expense of frequent replacement of wood or other less durable material.

Maintaining Calender Rolls.

One of the big items of maintenance is the so-called calender roll expense. The cotton or combination-filled calender rolls are very expensive and if not properly taken care of, their life is very short. A careful record of each roll should be kept as to yards of goods passed over it, and as to just what is done to it from time to time. Such rolls, very soon after being put into use when new, loosen up, and should be taken out of the machine, unlocked and re-pressed within a month after first being put to work. They should be cut away slightly towards the ends of the roll so that the hot cylinder will not be so apt to burn the exposed part of the roll outside the selvages. Care should be taken to see that the calender operataes with even sets, and that the machine is not allowed to stand still with hot roll in contact too long with the cotton bole. The fine engraving on schreiner calender steel rolls can be successfully protected and its life increased by chromium plating.

A departmental mechanic is very useful and successful in the calender room if he gives sufficient thought and study to the reduction of calender roll expense.

The make-up room is another department well served by a departmental mechanic. Here we have a number of light machines such as hookers, inspecting machines, double and roll machines, etc., which one man can easily keep in first-class condition all the time. In fact, this same man would be expected to look out for all plant sewing machines as well.

In this article we have not attempted to cover steam, power and water equipment, nor the general upkeep of the buildings. In general, the maintenance department must be constantly on the alert to catch trouble before it happens. In fact, by co-operation with the engineering department it should endeavor to anticipate trouble while equipment is being laid out, designed or purchased. This means a careful consideration of materials, locations and arrangements, so that later on, when the equipment is installed, the various parts will stand up under their respective assignments, and so that when repairs or replacements are necessary they can be accomplished with least effort. That progress is being made along these lines in finishing plants is borne out by the fact that the records of many plants are showing a lower maintenance cost from year to year.

A Modern and Efficient Mill Stock Room and Supply System

By James W. Swiney

A DESCRIPTION of the stock or supply room in operation at a well-known Georgia mill. It tells how the room is laid out, describes and illustrates the various kinds of bins used for different supplies, and shows how the supply room is keyed in with the maintenance program in the mill itself for the purpose of furnishing accurate and prompt information as to the condition and operation of any section in the plant.

IT WOULD BE NECESSARY to turn back but a short while in retrospect to find many mills that had supply rooms that were just termed supply rooms—and that was about all that could be said for them. It has only been within the last few years that the large majority of mills have changed over to the belief that an efficiently well kept supply room is an asset. Until recently most supply rooms were rather dark, dingy places and the supplies were kept in no orderly fashion whatsoever. The supply room man had to rely upon his memory to find the required parts whenever an operative brought in a requisition (if requisitions happened to be used at that mill), and if the regular supply room man happened to be out one day, then the new man on the job found it necessary to spend a large part of the day just looking.

Several years ago, a mill in Georgia decided that it would be a good investment for them to put in a supply room that would be so maintained that any of the supply room force could put their hands on any of the supplies in the room without any waste of time in hunting. The system adopted by this company makes it possible for them to know at all times the exact amount of supplies on hand, the correct time to order, and proves a means of providing an incentive for the section men to run their sections with as low cost records as possible.

The supply room of this company is a large, well lighted room. A feature of the lighting system is that each light in the room has a pull socket, which makes it possible to turn on only the lights needed when working in one part of the room, rather than having to have on all the lights during this time. There are six sectional switches.

A good idea of the lay-out of the room may be obtained by referring to Fig. 1. As will be seen by this layout, the room is arranged with nine large bins (part of these being shown) running crosswise down the center section of the room. The first bin is designated as Section A, and each compartment of the bin is numbered, running from 1 through whatever number happens to register the last compartment in the bin. The second bin is then designated as Section B, and the numbering of the compartments here is taken up where it was left off in A . For example, if Bin A contained 168 compartments, then the first compartment in B would be 169. The third bin is Section C, the fourth D, etc., through Section J.

In Sections A through F loom supplies are stored;

Fig. 1. Showing Section A of the bins, and indicating the general arrangement of the stock room. Note ladder for bins on side wall.

1	Draper Corporation	4	Norris Brothers Company, Greenville, S.C.
2	Shambow Shuttle Company, Greenville, S.C.	5	
3	Litchfield Shuttle Company, Atlanta, Ga.	6	

DATE	FROM	ORDER No	ORDERED	DATE	RECEIVED	PRICE	FRT.	NET PRICE	DATE	DEPT.	ISSUED	BALANCE	DATE	DEPT.	ISSUED	BALANCE
1-28-30	1	113	700	1-29-30	700							300				
									1-26-30	W-2	2	298				
									1-27-30	W-8	2	296				
									1-29-30	Rec'd	700	996				
									1-30-30	W-1	2	994				
									1-30-30	W-1	2	992				

MIN.	MAX.	DEPT.	REMARKS
300	1000	Weave	

BIN No	LOCATION	MAKE	CAT. No	ITEM
16	A Mid Center	Draper	#2 M-87	Shuttle Springs

REQUISITION

Dec. 16, 1930

Weave DEPT. 12 SECTION

	SUPPLIES WANTED	BIN No
2	2 M-87 Shuttle Springs	16

OVERSEER

MONTH 19

DEPT. SHIFT SECTION No.

WEEK ENDING	No. REQUISITIONS	AMOUNT
TOTAL		

POSTED BY

Fig. 2. At the top is the ledger sheet carrying the record of receipts and withdrawals of supplies, and the perpetual inventory. Lower left, the requisition issued for all supplies. Lower right, the description printed on the envelopes in which requisitions from different sections are placed . . . . . .

in Sections G and H are spinning supplies; and in Sections I and J carding supplies are kept. The advantage of having the supplies grouped in this manner is very obvious.

Sections K, L, and M are shelves next to the walls, which are divided into varying sized compartments. These are as those seen at the right in Fig. 1. The numbering of the compartments here is taken up where it was left off at J. A ladder with rollers attached to it enables the supply room man to reach any compartment in these bins with ease. Bolts and screws are kept in Section K, small carding supplies in Section L and small spinning supplies in Section M.

The lettering of the sections is then continued with corresponding shelves on the opposite side of the room. Sections N, P, and R are lined up against the wall on the right side of the room just as Sections K, L, and M are on the left. A ladder is also used here. Sections N and P contain carding and spinning supplies, while Section R contains miscellaneous supplies, such as crayons, lanterns, etc. Compartment numbering here begins with the number following the last number of Section M.

We next have Sections S and T, which represent two large bins, one of which is shown by Fig. 3. These two bins are very similar. The only big difference being that T contains an air tight compartment in which card clothing is kept. In the lower portion of the bin such supplies as tacking twine, stitching thread, blueing, etc., are kept. The top contains fire buckets, rope, cylinder screens, electric bulbs, etc.

In Section U, which may be seen by Fig. 4, the protection rods, cloth rolls, and the like are kept. Sections V and W are air-tight compartments (Fig. 5), and contain cylinder fillet and emery fillet, respectively. Section W, which contains the emery fillet, has a humidifier in it that allows the fillet to be kept moistened. Section Y consists of two racks which contain rolls of clearer cloth and slasher cloth. Section X (Fig. 6) is the section where the belting is stored.

In a warehouse next to the supply room bulk supplies—burlap, starch and size—are kept, and they are requisitioned out just as any of the supplies in the supply room. A cross-index similar to the one kept for the supply room is not kept for these supplies, but a perpetual inventory is kept at all times.

It is necessary for anyone coming to the supply room for any parts to bring a requisition signed by the overseer or second hand. The operative gives this requisition and the old part, if he has one, to the supply room man who refers to his cross-index file if he happens not to know just where the part is located and finds out in just which section and compartment number the part is located.

This cross-index file would enable anyone placed in the room during the absence of the regular supply room man to find any parts in the room without a great amount of difficulty. This removes the fear of the disturbance that might occur should the supply room man be out a few days. The file is listed according to departments, and the parts are then listed alphabetically. This is true with everything with the exception of weaving supplies and screws and bolts. Weaving supplies are listed according to catalog number, as all of these supplies contain a catalog number. Bolts and screws have a separate section and are listed according to sizes.

For illustration, let us assume that a new man is in the room and an operative brings in a requisition for a shuttle spring. He gives the requisition and the

old part to the supply room man who refers to the cross-index file under Weaving. He then glances down the line of parts listed under weaving in numerical order until he comes to the number of this part, which happens to be 87, and finds that it is in Compartment No. 16. If the operative had brought in a requisition for a stripping brush for a card, then the supply room keeper would have looked in the cross-index file under Carding where the parts would be listed in alphabetical order.

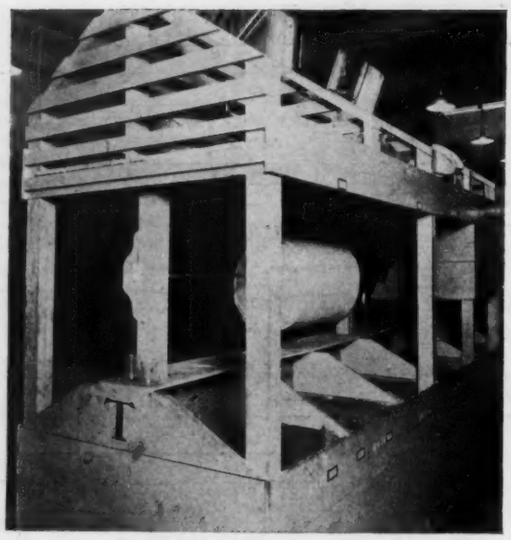


Fig. 3. Showing Section T, with air-tight compartment for card clothing, and space for twine, thread, buckets, rope, light bulbs, blueing, cylinder screens, etc . . . .

If a shuttle happens to be the item brought in to be replaced with a new one, the supply room man takes this shuttle which has on it the number of the loom from which it was removed, and replaces it with another shuttle on which he again places the number of the loom. This enables the supply room keeper to keep a check on the number of shuttles any particular loom is using, and if this number becomes excessive he informs the overseer, who then takes the necessary steps to have this fault of the loom corrected.

The supply room man takes the requisitions brought in by the different operatives, and after placing the bin number on them, places them on a hook in the supply room. Each morning a young lady that has charge of the supply room office takes these requisitions and posts them in a ledger that contains sheets as shown by Fig. 2. This provides a perpetual inventory, and just as soon as the supply on hand drops below the minimum allowance for any one particular article, an order is placed and this is also entered on the sheet on which the requisition is posted.

Referring to the illustration of the requisition, let us assume that a requisition for two shuttle springs is brought in. The supply room man marks Compartment No. 16 on the requisition and hangs it on the hook. At the end of the day or the next morning the young lady in the supply room office takes this requisition and turns to the sheet for Compartment No. 16 in her ledger and charges off two shuttle springs. She finds that this reduces her supply on hand below her minimum allowance, so she orders the amount required to bring her stock on hand up to the maximum.

At the end of each day the requisitions are figured and the prices of the items of each requisition placed on the back. Then at the end of each week these are totaled for the different sections and placed in an envelope, as shown in Fig. 2. At the end of each month the weekly reports of the different sections are totaled and a report made which is submitted to the superintendent.

A monthly departmental report is also made which has the following headings listed on it: Department; Amount; Cost per Pound; and Average.

When the cost per pound and average for the different departments is figured, this departmental report is also submitted to the superintendent, along with the sectional report (this sectional report is made by merely taking the monthly totals from the envelopes). If the superintendent okehs these two reports, they are posted on a bulletin board where they may be seen by any of the overseers or section men. If they are dissatisfied with the reports of their sections, they may inspect the requisitions in the supply room office and see just where they spent their money. As all requisitions are signed by them, they have no come-back unless a mistake has been made by someone

Fig. 4. Section U, containing protection rods, cloth rolls, and the like . . . . . .

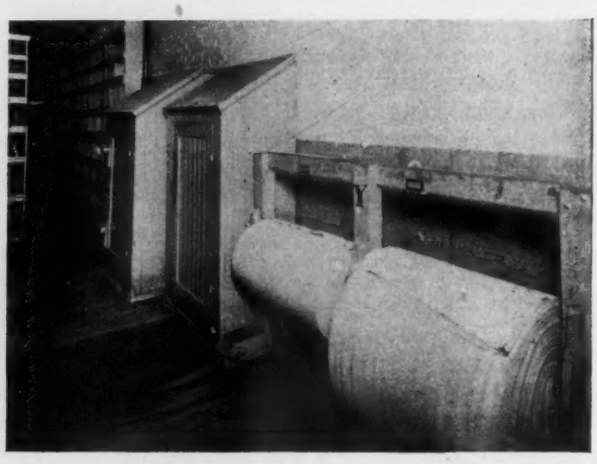


Fig. 5. Sections V and W, containing cylinder and emery fillet; and Y, slasher and clearer cloth . .

in the supply room office in figuring the reports, in which case, of course, the necessary correction would gladly be made.

One thing that has proven quite an incentive for the section men to keep their cost record as low as possible has been contests that have been held for the best cost record. Prizes are given every six months for the section man having the best cost record based upon a standard cost for which he should run his section. This standard is an average which is figured over a period of time as representative of the cost necessary to keep a section in good shape. It varies from one period to the other. In other words, if at the end of a period of two years a section man's standard is a given amount, it does not necessarily mean that his standard will be the same at the end of two and a half or three years, for it may be that at the end of two and a half years his standard has been lowered considerably due to the fact that his cost for the last six months was exceedingly low. If the same thing should take place during the next six months, then, of course, his standard would be still lower at the end of three years. Naturally, the longer the period of time over which the standard is figured, the more nearly will it represent the true cost to run a section.

In order to prevent any injustice a committee of overseers and section men go over the sections over which they are not in charge and inspect the sections of the men who have high and low records. They go over the sections of the men with the high cost records to see that they have no supplies which might be utilized the following six months in order to make a good record during that time, and over the sections of the men with low cost records to see that they have not neglected any of their machinery to make a good showing.

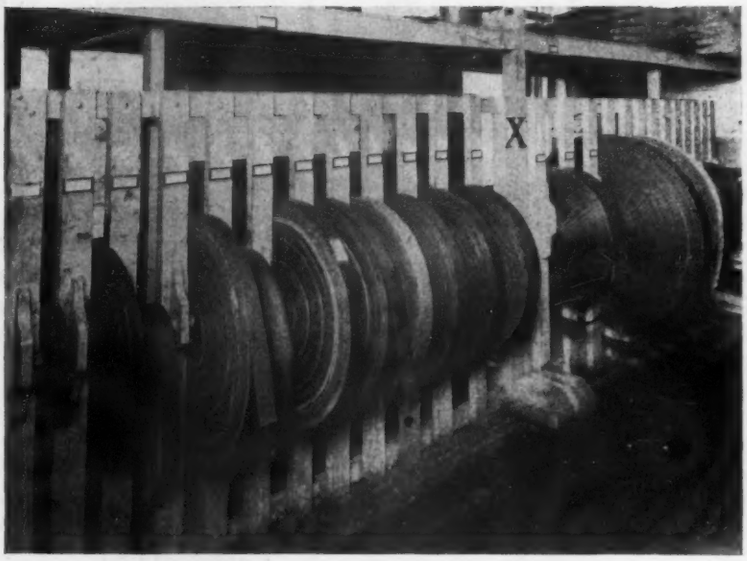


Fig. 6. Section X, where belting is stored.

Even when goods are ordered that are not kept in stock, the order passes through the supply room. The order is first okehed by the superintendent, after which a record is made of it in the supply room and the order placed. This enables the supply room to know at all times just what is on hand and just what has been ordered.

VISCOSE ADOPTS NEW PLAN.

Announcement is made by the Viscose Company of an important step supplementing its quality-control plan and involving its entire output of Sombray, the new rayon yarn just introduced by Viscose.

The new rayon is a 144 denier, 36 filiament yarn, triple-subdued with its dull effect inherent in the special manufacturing process, the company states. They point out that it is not necessary to put cloth made from Sombray through a delustering process in order to reduce its brilliance, and that it produces a strong cloth that meets all standard specifications and is being used most successfully at present by knitters, employing both non-run and plain weaves.

It is the plan of the company, beginning with 1931, to ship Sombray yarn only to those knitters who have signed contract-agreement, with the Viscose Company, agreeing to make Sombray cloth of or above standard specifications which have been set as minimum. It is stated that knitters also agree to sell their manufactured Sombray cloth only to those manufacturers who have received the approval of the Viscose Company. Such manufacturers are asked first to sign contract-agreement with the Viscose Company whereby they satisfy the latter in regard to the manufacturers' constant adherence to cut and size specifications of garments in which Sombray cloth is to be used.

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GROUP LIFE INSURANCE FOR COTTON MILLS.

Group life insurance exceeding $200,000 has been provided for employees of the Fitzgerald (Ga.) Cotton Mills through a contract recently made by their employer with the Metropolitan Life Insurance Company.

Approximately 190 employees have enrolled in the plan, which is being underwritten on a cooperative basis. Under this arrangement, employer and employees jointly share the cost.

In the main bloc of subscribing workers, each receives $1,000 life insurance, which also includes a provision for total and permanent disability. Under the terms of this clause, an employee suffering complete disability before age 60, will receive the full amount of his insurance, with interest, in equal monthly installments.

Employees of Commander Mills, Inc., Sand Springs, Okla., are participating in the benefits of $173,000 group life insurance, also with the Metropolitan Life Insurance Company.

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CLOTH MENU.

The Southern Railway System has just introduced a novel menu folder printed on cotton cloth, it was announced recently by C. K. Everett of the New Uses Section of The Cotton-Textile Institute. At the present time these new folders are provided for dining cars in service on the Crescent Limited, the Southern's fast train between New York and New Orleans.

During the holiday season the menus were printed in three colors—two shades of green in addition to black. An explanatory note pointed out that the cloth used for the menu is one of the many products of the textile industry served by the Southern Railway System.

Water Softening for Textile Plants

By S. F. Alling, Sales Manager,
Hungerford & Terry, Inc.,

IN THIS DISCUSSION, Mr. Alling traces the history of water softening application in the South, as well as outlining the developments in the process itself. He describes in detail the elements of the natural zeolite; and cites instances of the benefits of properly softened water in several different applications of a textile nature.

This interesting paper was presented at the Charlotte meeting of the Dyers', Bleachers' and Finishers' Section of the Southern Textile Association last month.

MANY COTTON MANUFACTURERS remember a very prevalent belief that bleaching and dyeing could not be successfully conducted in the South on account of the water. Efficient filter plants have demonstrated the fallacy of this belief and have shown that southern waters are second to none when properly filtered.

In company with New England the South is now engaged in dispelling another fallacy that the unsoftened waters of New England and the South ranging from 2 to 4 degrees of hardness require no further treatment than filtration to render them perfectly satisfactory for dyeing, bleaching, finishing and other textile processes. The rapid increase in the number of water softener installations in Southern mills in the last four or five years is in itself proof that decided advantages can be gained by the installation of water softeners.

Water softening has been a progressive requirement. Twenty years ago water softeners were seldom installed for waters of less than 8 degrees of hardness. With the then known processes a softener that could deliver a water averaging 4 degrees of hardness was considered a reasonably efficient apparatus. In exceptional cases 3½ degrees of hardness were obtained. These softeners were troublesome devices requiring lime and soda in the process and were generally pretty messy affairs. As a result waters of 6 degrees of hardness were classed as soft, and waters below 4 degrees of hardness were classed as very soft. As the New England waters mainly run from 2 to 4 degrees of hardness they attracted an enormous number of industries to that locality. The waters of the coastal plain of the southern states possessed about the same degree of hardness but their virtues were obscured by the enormous amount of mud they carried.

Then the zeolite softener appeared. This was a filter which instead of being filled with sand was filled with zeolite, a substance which possesses the property of extracting lime from the water and when exhausted can be regenerated with a solution of common salt, after which it is again ready for another period of lime absorption. This cycle can be extended almost indefinitely without deterioration of the power of the zeolite.

The advantages of a zeolite softener as compared with the old lime-soda softener were tremendous. In the first place the water was made 100 per cent *soft*, or as it was then expressed, reduced to zero degrees of hardness. No measuring of chemicals was required in this process. Fluctuations in the degree of hardness of the raw water were automatically met by this wonderful apparatus. No more chemistry than is possessed by the average man was necessary to run this softener successfully. With many waters the cost of softening with the zeolite softener was less than the lime soda process.

But there was one extremely serious drawback to the advance of water softening by this method and that was the excessive cost of the zeolite. This was originally manufactured in Germany and was at first sold at about $2200 per ton. Even at this figure some of it was sold but the price soon dropped to about 40 and then 20 cents per pound and this latter figure was maintained for many years. Even at this price many industries found themselves able to purchase a zeolite water softener. Competition had also stepped in and an American zeolite was brought out which was claimed to be superior to the German article. This effected a still further reduction in price and more softeners were installed.

In the meantime it was found that certain clays and earths possessed most of the elements necessary for the manufacture of a zeolite and it was simply necessary to supply the missing elements and to bake the product to make a perfectly good zeolite. Then came the discovery that the great greensand beds of New Jersey possessed water softening properties and that this greensand was a natural zeolite. True, it had some unpleasant characteristics, one of which was that after regeneration it was quite soluble and the softened water had much the appearance of thick pea soup. This, however, was merely a problem for the chemists to solve and this was done in various ways, heat, chemical solutions and gases being some of the methods employed to make greensand a satisfactory water softening zeolite. Still again, greensand, while making water 100 per cent *soft* was of very low softening capacity or exchange value and part of the chemists' problem has been to raise this exchange value to a point where it could compete with the synthetic zeolite.

Success has attended the efforts to produce a satisfactory zeolite of good exchange value from the greensands.

Such zeolites as are made from the bentonite clays or from greensand are commonly referred to as natural zeolites. The name is somewhat misleading because a quite elaborate chemical treatment is necessary in their manufacture.

A great advantage of the greensand is its cheapness. It possesses other valuable properties such as great durability, ruggedness, practically non-sensitiveness to acid solutions and iron, but its distinguishing

characteristic is the cheapness with which it can be manufactured. The base price today of greensand zeolite is about $130 per ton. Comparing this with the high prices maintained so many years and considering that even at that price many water softeners were installed, it must be apparent to all that the zeolite water softener is now an article that can be installed in every plant without putting too great a burden of investment upon the purchaser.

Nor must it be assumed that because of its cheapness the greensand zeolite is inferior to any of the others. It is not the writer's intention to claim superior advantages for any zeolite but when viewed from all angles greensand is as good as the best and better than the rest. Its cheapness is merely due to the fact that nature has supplied the raw material so bountifully and so inexpensively that little is required from the hand of man to complete this wonderful product.

Lest there be some who are not fairly familiar with the zeolite water softener let me state that this softener is merely a variation of the familiar water filter. It may be of the pressure or gravity type and the flow may be upward or downward through it. It differs from the familiar water filter in that zeolite sand instead of ordinary silica sand is placed in it and that it is equipped with an apparatus for regenerating which consists of a brine tank and a pump or ejector for delivering the brine to the softener for regenerating purposes.

In operation the water is passed through the softener just as through a filter. As it passes through the zeolite all of the lime and magnesia, although in solution, is completely retained in the zeolite bed and the water emerges from the softener 100 per cent *soft*. When the zeolite bed has retained all of the lime and magnesia it can hold, operation is suspended for about half an hour while brine is forced through the zeolite bed and the by-products of regeneration are washed out. The softener is then again primed for another run and this process can be repeated for years without the zeolite losing its exchange capacity or softening power. The cost of operation is represented by the amount of salt consumed and an allowance of half an hour for labor during each regenerating period.

Salt costs on the average of $14 per ton or about ¾ of a cent a pound. On this basis 1,000 gallons of water having three grains of hardness to the gallon can be made 100 per cent soft for about one cent.

It is not for the writer to tell you the benefits of soft water. You all have the keenest appreciation of the troubles that are caused by an unsoftened water supply and you know how much smoother and more satisfactorily everything would run if you had 100 per cent *soft* water. There is, however, a strong probability that there are economies that may be effected and processes that may be improved that have never been considered by you. It has been my experience that certain processes used which are considered part of the dyeing and bleaching process really have no place in these operations and are performed to overcome hardness of the water. They have been used so long that they occupy an honorable position in the manufacturing processes but they are really only compromises with the water. After a softener is installed the manufacturer eventually discovers that these auxiliary processes can be omitted with decided advantage both to his product and to his pocket-book. I have in mind the case of a felt manufacturer who from time immemorial had used about six thousand dollars worth of ammonia every year as a necessary part of the finishing process. Shortly after the installation of a water purification plant he discovered he could get better results by completely omitting the ammonia from his process and he was just six thousand dollars per year ahead forever afterward.

Another instance is that of a dyer dyeing silk stockings. This man was sorely beset by redyes and seconds, redyes running as high as 60 per cent at times. After the installation of a water softener both redyes and seconds were practically eliminated. In this case the reduction in redyes was to have been expected, but the great reduction in seconds came as a surprise to the manufacturer.

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Another economy that is effected by the installation of a softener is in the coal pile. A zeolite softener keeps the tubes and shell of a boiler clean and free from scale. Consequently, the heat transference is always excellent and the heat from the fire goes into the water and not up the stack. Even with soft waters economies ranging from 10 to 30 per cent are often effected in the consumption of fuel by the installation of a softener.

"Another economy that is effected by the installation of a softener is in the coal pile. A zeolite softener keeps the tubes and shell of a boiler clean and free from scale. Consequently, the heat transference is always excellent and the heat from the fire goes into the water and not up the stack. Even with soft waters economies ranging from 10 to 30 per cent are often effected in the consumption of fuel by the installation of a softener."

The standards of excellence are being steadily and radically raised and that an article which might have been classed as a first a year or two ago is today positively listed as a second. Competition is keener today than ever before and to secure business one must show a superiority either in cost or in quality, and preferably in both. Those who fail to maintain this standard do not drop into second place, they drop out of the picture. The iron law of nature has decreed that only the fittest can survive and the weak must fall before the strong. The laws of business are just as severe and the man who attempts to maintain his position with inferior equipment and inferior processes must as inevitably fall as will the weaker animal of the jungle.

The zeolite softener is now within the reach of all and within the range of every manufacturer's budget. Is it safe, when such a small outlay is involved, to attempt to compete with the properly equipped manufacturer unless equally well equipped?

Dyers, Bleachers and Finishers Hold Helpful Meeting at Charlotte

THE MEETING of the Dyers, Bleachers, Finishers and Mercerizers Section of the Southern Textile Association, which was held at the Hotel Charlotte, Charlotte, N. C., on January 10th, was highly successful from several different standpoints. The luncheon, which really started the meeting, was a delightful affair; the general discussion, which followed the reading of the different papers at the luncheon, was well attended by a crowd that took part in the discussion in such a way as to make this part of the meeting very beneficial; and the banquet that was given on Saturday night had several very interesting talks and entertainment features so spliced in that it was thoroughly enjoyed by everyone of the crowd of approximately three hundred that attended.

A VARIETY of pertinent subjects covering dyeing, bleaching and finishing constituted the program of the meeting, and the discussions were made by competent speakers. An enjoyable entertainment program and a representative attendance added to the discussions in making the convention an unusually successful and profitable one.

Paul Haddock, chairman of the division, introduced the speakers at the luncheon. The first to speak was S. F. Alling, sales manager, Hungerford & Terry, Inc., Clayton, N. J., who spoke on "Water Softening as Applied to Textiles." The second on the program was Chas. P. Walker, of A. Klipstein & Co., Charlotte, N. C., whose paper was on "Colors Other Than for Dyeing and Printing." Next came Dr. E. W. Pierce, Ciba Co., New York, whose paper was entitled "The Dyeing for and of Mixed Fiber Fabrics." Last on the program was C. L. Eddy, Brandon Co., Travelers Rest, S. C., whose paper was on "The Finishing of Mixed Fiber Fabrics."

Mr. Alling in his excellent paper told of how efficient filter plants had demonstrated the fallacy of the belief that bleaching and dyeing could not be successfully conducted in the South on account of the water. He went ahead to point out what is really considered hard water, the advantages of a Zeolite softener, the economies to be attained by the use of green sand, the benefits of a water softener, and other equally important subjects. This paper is reproduced in full on page 328 of this issue.

Colors Other Than for Dyeing and Printing.

Mr. Walker covered a very broad subject in a very effective, but brief and concise manner. His talk in part follows:

"The first place where color is used in textile manufacturing is at the slashers for cut marking. Cut marks are applied to the warp at specific intervals for the purpose of checking production, reckoning costs and figuring wages of operators. After the goods leave the weave mill, these marks serve no purpose and should not be confused with head-end, tail-end and trade marks which remain permanent throughout the bleaching and finishing processes.

"The first consideration in the selection of a color for cut marking is: Will it show on the woven fabric? And, second, will it mark off in subsequent operations of bleaching, dyeing or finishing of double cuts where at least one cut mark is left in at the weaving mill? Right here is considerable food for thought. On grey goods, to be subsequently bleached, it is obvious that the cut mark should wash out completely without staining any part of the goods and, if the goods are one-fiber fabrics, no difficulty should arise in a proper color selection. Insoluble pigment pastes would appear the proper thing. Acid colors in starch can and are used.

"Head-end and tail-end marks are put in goods for the purpose of checking stretch and also, in the case of valuable goods, to insure that original lengths are returned in full. These marks must be permanent and are either woven in at the loom or sewed in before finishing. The use of cellulose lacquer would simplify the application of these marks and thereby reduce finishing costs.

"The marking of lot numbers on piece goods is another point where color might be used. Tar has been used for marking goods for bleaching for many years, and has proven satisfactory if used right and not applied too heavily.

"It is with a great deal of timidity that I approach the subject of staining yarns for identification purposes. The increased use of acetate fibers, and the many different rayons, alongside animal and vegetable fibers, especially in the hosiery business, has raised a bewildering mass of problems.

"I leave it to some chemical research body to evolve colors that do not dye anything, and, in the meantime, humbly offer as a solution of this problem, the use of easily dischargeable azo colors and a preliminary stripping in a hydrosulphite bath before dyeing. This suggestion is made for cases where the yarns are sold from stock and where it is not known what other fibers will be used with them.

"Probably the most important use of color, other than for dyeing and printing of textiles, is the use of blueing on bleached goods."

Dr. Pierce next gave a very comprehensive talk on dyeing mixed fiber fabrics. He said in part, "Fabrics composed of combinations of the various textile fibers may be considered as of two classes; those made up entirely of undyed fibers and those in which some of the fibers have been dyed prior to weaving or knit-

ting. The first class involves only piece dyeing problems but the second class includes loose stock, skein, warp and beam dyeing as well as the piece-dyeing which follows.

"The first problem of the dyer is to cleanse the goods so that every fiber in the combination is freed of all foreign matters and so no fiber has suffered in strength, nature or luster. To-day the market affords a large selection of detergent and emulsifying materials that cover the dyer's needs for every emergency.

Dyeing for and of Mixed Fiber Fabrics.

"The dyeing of mixed fiber fabrics assumes two phases; first, the production of solid shades, and, second, the production of multi-color dyeings. In dyeing solid shades on cheap goods where fastness is not a paramount consideration, we have a large series of substantive dyes that will give, in themselves, fairly good solid shades on most of the fibers, excepting acetyl silks, but need a small amount of shading with neutral dyeing acid dyes to adjust the animal fibers to the shade of the vegetable fibers. Much depends on the fabric construction, for if the fibers have been mixed before spinning, slight differences in shade will not be noticed, but if the different fibers are in threads adjacent to each other, the slightest difference in tone is easily detected and shows plainly the mixed fiber construction of the goods. So much has already been written on the subject of union dyeing that we may pass over it rapidly, but one comment seems to be in place and that is—as the relative affinity of mixed fibers for the dyes is so largely dependent on temperatures, as well as alkalinity of the bath, we should never trust to the old-fashioned method of dipping a thermometer into the steaming liquor and trying to read the temperature from time to time, but should either have a permanent thermometer attached to each machine or use automatic temperature control.

Chairman Haddock.

"Mixed fiber dyeing may be raised to a much higher plane and the ultimate value of the goods increased by the use of fast colors.

"In most cases where fibers are shown fairly evenly covered it will be found that one or another has the dye only loosely affixed and is in the nature of a stain rather than a true dyeing. The best results are obtainable in light shades without the addition of salt until the cotton has filled up. Medium shades require no salt whatever and in dark shades it is always difficult to fill cotton in the presence of any of the rayons. As stated before, much depends on getting the proper dyestuff as there are but few available.

"Mixtures of silk and wool cause more trouble in their preparation than in dyeing. Acid dyes in an acid bath are very sensitive to the temperature and the color will shift to either fiber in a short time as the temperature changes. A safer and better way of dyeing these mixtures is by the use of the fast neutral dyeing colors which are also better adapted for later discharge printing.

"Woolen and worsted goods are often dyed with silk effect threads. In such cases you must obtain the dyestuffs recommended for the purpose by the manufacturers; some are acid dyes but many are afterchromed colors. These need a special caution; the action of the chrome must be complete, because if the proper color change has not been brought about in the dyebath or if much free chrome is left in the goods, there will be a further change when subjected to the heat of the dryer or the finishing processes and either the whole shade will change uniformly or result in clouds or shaded goods.

"Many classes of fabrics are made up with certain cotton threads already dyed with sulphur black. These are not only for designs but may form the backs of wool, silk or mohair plushes. There has been one great objection from the start; sulphur black, when acted on by acids, is especially inclined to become tender some time later. This is said to be due to the further oxidation of some of the sulphur in its composition, so it is recommended to complete the oxidation of this dangerous part of the sulphur by giving it an energetic oxidation with chrome and acid as soon as it is dyed. This makes the black a trifle redder, but after it is washed there is nothing left to oxidize and tender the goods later on.

"Cotton threads for cross-dyeing may be of the better class of developed colors, sulphur colors, vat dyes or napthols. All of these are too well known to need further comment. The same will apply also to rayon.

"Silk effect threads, whether for resist or not, must take into account the fact that the goods will have to stand scouring or a light milling before dyeing, hence the regular acid dyes are not suited. Fast neutral dyeing colors which will stand milling or else vat dyes of the indigoid class will give the best results. Silk is resisted, and wool may be put through the same process, by first dyeing it with a fast color and then saturating the fiber with tannic acid, which is then fixed with tin crystals. Now as this tin tannate, especially after it has contacted with alkaline soap, has a rich orange tan color, it is evident that while it would not show much influence on an orange, gold or deep red shade, it would make a very poor showing of a royal blue or violet. If a definite shade must be furnished, it is not possible to use enough resist to fill all the requirements, while if fully resisted the shade will be flat. This difficulty with resisted silk will probably be solved by the further use of acetyl fibers, immunized and amidized cotton."

The next paper read was by Chester L. Eddy on finishing of rayon and cotton piece goods. As it was impossible for Mr. Eddy to be present, the paper was read by Secretary Taylor. His paper in part follows:

"In handling the rayon of today we find from actual experience that we can handle it in a cotton finishing plant to a certain degree. I don't mean that all constructions of rayon can be so handled. The print cloth

construction with rayon filling known as Alpace can be printed and dyed satisfactorily. Serges or twills for the lining trade and woven crepes with rayon filling are being finished in large volume in some of our eastern finishing plants. As in all our work, whether cotton or rayon, a certain amount of judgment is necessary to carry our work on to a successful conclusion.

The Finishing of Rayon and Cotton Piece Goods.

"In finishing rayon mixtures it is very necessary to be careful of the speed of the machine which you are operating, because excessive speed is damaging to the cloth. In other words, you would not think of running it through a heavy log washer at 70 yards per minute. If you did I believe you would find the filling throughout the piece broken. In holding it to the light, the piece would look as if it had been held in front of a shot-gun. The same is true in handling the cloth through a wooden roll starch mangle with a heavy set. The best results are obtained with a brass and rubber or 2-rubber bowl starch pad. The process of finishing these constructions, in a measure, are the same as cotton. For instance, you would diastofor the same as cotton for the same reason you diastofor cotton, but in singeing, rayon will not stand the heat as well as cotton. Therefore, it is necessary to singe with a gas flame, using not over three burners, two on the face and one on the back. Singeing is necessary to retain the luster in the finished goods, because the fuzz will cover up the rayon and prevent the natural luster from showing. As in cotton finishing, it is necessary to have a good bottom to produce the proper finished result. Therefore, most fabrics should be bleached.

In bleaching the writer prefers peroxide bleach; first, because of quality of white obtained, and second because the goods have very little handling with the danger of tendering the fabric eliminated. The speed at which the kier is loaded should be run not over 100 yards per minute, as excessive speed with the goods in a wet condition will tend to fray. After bleaching, the goods may be run from the kier through a squeezer containing cold water, into a scutcher and dryed on the cans continuously. You will notice that you have lost quite a little of the natural luster which is due to the excessive heat of the cans, however, this luster will spring back when the fabric is wet out again. Your goods are now in a condition to dye through a pad, jig or continuous dyeing machine either direct color or vat. All dye liquors should not register over 130 degrees, because heat does kill luster. Rayon has a great affinity for dye-stuff, covers well, showing up very bright. If your temperature is too high you will find the rayon taking the dye a little faster than the cotton which to a small degree will give you a two tone effect.

"The writer has found by experience that the finishing materials are best added to the dye bath, and a great many times no finishing starches or gum are necessary. In fact starches should not be used in rayons as they have a tendency to cover up the luster. A transparent gum for body is sometimes necessary, using olive oil or some transparent oil to soften as the case may be.

"The goods are finished then over a tenter frame or palmer tenter depending on the finish required. In the case of a cotton tenter, notice should be taken as to the amount of heat and the speed should be about 55 to 60 yards per minute. Too slow speed will bake the finish, killing some of the luster, and, of course, too much speed will not give the goods time to dry. A little moisture left in the goods will take away luster. In no case is it advisable to finish rayon mixtures over cans in front of a tenter range.

"In case the fabrics need to be broken or smooth face necessary, one or two nips on a light calender may be given. Also a rubber covered expander works very nicely in front of the calender to retain the necessary width.

"We have found by experience that the best results acquired in finishing rayon mixtures are obtained with the least amount of handling, using as little heat as possible. You, no doubt, have heard someone say, 'I want something to develop luster in finishing,' or 'what can I do to get more luster?' It is the opinion of the writer that you cannot get more luster than the natural luster of rayon itself. If you will go back over your problem you will find something has happened in your process which has killed the luster. Be sure that you have not used excessive heat, and that the right kind of transparent gum has been used, to get the hand.

"It is very difficult to write and explain or give you in this paper all the different phases of finishing rayon, as the various constructions have to be handled differently, such as the rayon warp goods, either twill or sateen weave, in which case these fabrics could not satisfactorily be put into rope form, as the tendency would be to crack the face. The heavier twills and sateens which, of course, carry more moisture should be extracted before the final finishing process. These fabrics should be bleached if necessary on the jig. Roller bearing jigs should be used on rayon to relieve the tension. In fact tension should be watched very carefully in all processes.

"Rayon crepes should be dyed in the rope form wet in creels for the best results and extracted and finished in a crepe dryer.

"In closing, there is one thought that I wish to leave with anyone who anticipates finishing rayon and that is to handle the fabric as little as possible and leave out all strong chemicals. As in finishing rayon, the principal idea is to retain the natural luster, and to a certain extent water and machinery will give you the desired requirements."

Following these four talks the meeting was adjourned, to be followed a few minutes later by a general discussion of the different points that anyone cared to bring up. This discussion was conducted by D. C. Newman, of E. I. du Pont de Nemours and Co., Charlotte, N. C.

The banquet in the evening was opened by Marshall Dilling, president of The Arkwrights, Inc., who gave the invocation. Chairman Haddock displayed his usual ingenuity as toastmaster. He introduced George E. Wilson, Jr., mayor of Charlotte, who gave a very hearty address of welcome. J. O. Corn, president of

(*Continued on page* 375.)

THE TREND OF THE TIMES

By DAVID LAWRENCE

Published in the Textile Industry
Only By Cotton

CURRENT conversation on the depression reveals a notable emphasis on morale. The country can go from the dismal depths of December into the gentle heights of January and feel that it has made material progress. Contemporaneously, some unfavorable developments can appear on the horizon and when the markets show a rugged resistance thereto, we are made to feel that somehow the worst has passed.

What we are lacking, indeed, is a yardstick. Or perhaps it ought to be called a perspective. The difficulty is that most of us have not been through an experience similar to the present depression and we are, therefore, expecting a return of "normal business" with every confidence that what has been in the past will be once more. The wiser heads tell us that while we may properly become sanguine about the future in due time, we need not be disappointed if the next era is an entirely different one from that which preceded it.

Business men in 1931 already are altering their methods and rearranging their affairs so that new sources of revenue may be found.

Basically, the year 1930 saw what may be termed a reckless curtailment of expenditure. The term "reckless" is used advisedly because some of the larger corporations of the country became so panicky over the importance of retaining their earning of other years that they thought the way to accomplish that result was merely to cut down one side of the operation. They forgot that much of the expense built up in boom time was based upon the sound theory that in order to make money, business has to expend money.

There is no doubt that considerable waste and extravagance has prevailed and is more likely to become extensive in times of prosperity than in times of depression. But judging by the way some of the major industries reacted to the drop in business during 1930, one would have thought that the entire sales mechanism was founded on a false premise in the first instance.

What has happened recently is that as business has regained confidence in itself, there is a natural return to the expenditures which previously proved productive. Certain products cannot be sold except by personal selling. Other goods can only be distributed as a result of carefully planned appeals to the public. It is significant that several companies has a better year in 1930 than in 1929. These concerns are going forward confidently. Evidently, not a few companies which had no reason to curtail operations except an intuitive fear of catastrophe that never materialized now recognize the time spent in hesitation was expensive, indeed.

Caution is, after all, a virtue which can never be denied. But there is on the other hand another business attribute which so often spells success in modern business. It is the faculty of knowing when a sound economic basis for the distribution of a product has been reached and pushing ahead with all possible force for sales so long as the response is at all commensurate with the outlay.

Most significant in recent develop-

ments has been the continued stabilization of several factors which were more or less unsteady in the latter part of last year. Thus, the credit situation has improved substantially and the industrial companies which needed refinancing are finding a better market for their securities. Some of the larger issues of securities or bonds reveal how the bigger corporations managed their expansion programs during 1930. Apparently, large bank loans were made which are now being paid off with the proceeds of bond issues. Thus we see how important it was to provide a good bond market in the early part of 1931.

While here and there, the aftermath of 1930 is giving considerable concern, individuals as well as businesses have now settled down to a long, steady pull. The idea that good business would come in through the window or through the door without any effort being made to get it has apparently been erased from the minds of many business executives who thought that normalcy was inevitable as a matter of course and that sufficient momentum had been achieved in 1929 and the early part of 1930 to ride along constantly on the crest of previous sales effort.

Today's sales are being sought with more intelligence, with more power, and with more carefully planned expenditure than at any time since prewar days. Competition is keen in many lines and this has only challenged the ingenuity of American business the more insistently. We have witnessed in recent weeks an interesting series of sales efforts by some of the largest publications in the country which have refuted what appeared to be an excess of hesitation. The reminders that it is just as easy to go in one extreme as in another during a depression have been forcefully portrayed in large advertisements before the business public.

The significance of this drive which is all a part of the psychology of depression will not soon be lost on the American business man. For whatever may be the arguments in the executive committees and the boards of directors about the pulling power of advertising as a sales force, the fact remains that appropriations have been gradually cut down ever since the beginning of the depression. Publications which have always had faith in the value of advertising as a means of selling products were not very quick to realize how much slashing of advertising appropriations was going on until the latter part of 1930. Then they began to issue their warnings. They brought forth tables to show that during the 1921 depression the companies which kept up their advertising appropriations came out of the storm with many more assets than their competitors.

Looking ahead into the early months of 1931, we find that most of our business men have come to the conclusion that the world, after all, is not going to come to an end and that if three per cent of our people are unemployed, attention must be given to the needs and wants of the ninety-seven per cent who are employed and who have money to spend. The situation, of course, is far from clear and the business world has about adjusted itself to the belief that it may take two or three years before anything approaching 1929 in earnings will be experienced. But there were many good years even before 1929 and many a business executive will be happy if he can approximate the returns of 1927 or even 1928. The process of recovery is proceeding. Much of it is painful and most of the reorganization has yet to be done. But the difference between the first quarter of 1931 and the last quarter of 1930 is a difference in underlying feeling. American business has risen to the emergency with a determination to find a way to rebuild and reconstruct on a firmer foundation.

CURRENT TOPICS

Talk of the Month.

IT WAS an encouraging statistical start for the year in the cotton industry that was portrayed in the middle of January report by the Association of Textile Merchants of New York, with its estimate that production in 1930 was lower than for any year since 1919 and forecast that benefits from this impressive reduction would be felt in increasing measure during the present year. "Yet," stated about the same time Ernest N. Hood, treasurer of the Pequot Mills and vice-president of The National Association of Cotton Manufacturers, "so long as there remains a large over-capacity to produce, I fear there will be a more or less constant condition of unprofitableness in our industry."

Prudence in the Convalescent Stage

Mr. Hood expressed the conviction that 1931 will be a much better year than 1930 and the Merchants Association found in the statistical situation early in January a condition which represented "a victory for those who have been outspoken for a materially reduced output of cotton cloth during the year just closed." However, one must bear in mind that the problem of regulating production in a time of depression is different from the same problem in another situation and the latter condition is now faced. Either it will be productive of further regulation, or the industry will have to undergo the stress of continued uneconomic competition until overcapacity has been remedied by the natural law of the survival of the fittest.

While the depression created a generally favorable attitude toward reasonable operation of cotton machinery, the first evidences of a broadening demand and better outlook brought signs also of irritation over regulation in some quarters and yet the recent surveys of general business indicated that prudence in going ahead was desirable. The doctors always have warned convalescents against being too confident of their strength after severe illness. "Oh, I feel all right," says the patient the first time that he is allowed to move. But he gets a relapse if he does not heed the advice to do much less than he feels fit to do.

Heeding World Developments

ALL INDUSTRY TODAY is convalescent and prudence is necessary, not only as a measure of emergency for 1931 but as a precaution against disruption to the future economic position of the country. More than ever it is imperative to heed world developments and industry is only a step behind agriculture in problems of international scope. The last depression was aggravated by the fact that a world-wide over-production of raw commodities upset the balance of things. The mechanization of industry, at first a blessing, tends to become a Frankenstein monster. A co-operative effort to curb its evils and further to bring out its benefits must be made to avoid new disaster. Industry has a lesson to heed in agriculture.

Agriculture is far from out of the predicament into which overproduction has thrown it. To some extent, that is, in the case of raw products which are used in manufacture, industry will help to ameliorate the situation in agriculture. But in the case of food crops, industry will not help greatly except so far as it improves the purchasing power of the public through alleviating unemployment. It is obvious that there is a limit to the betterment from this direction, because the eating capacity is not very elastic, so the coffee, sugar and wheat trades of the world are still in the midst of an uneconomic situation which is baffling them.

Industry not only faces the problem of avoiding a similar pitfall, through unwise use of the extraordinary capacity of machinery today, but it confronts social difficulties which become intensified in times of depression. Thus we find Henry S. Dennison, a well-known New England manufacturer and student of economy, sounding a warning against another depression. He says that business interests "ought to take seriously to heart the unanswerable indictment which depression makes against the capitalist system." He implied that now is the time to take measures against further depressions and not to wait until they arrive, as has been the practice. Just as soon as depressions have passed, he stated, the leaders have gone about their business and forgotten everything else.

Among the anomalies of the capitalist development is that the leading exponent of progress under this system, the United States, is perhaps the most backward of nations in regard to night operation of machinery. At any rate, other leading industrial countries are leading us in the eradication of night work for women and even backward nations have legislated against the practice or accepted laws prohibiting it where they are dependents of leading countries. An interesting recent commentary on the disadvantage of night work from the standpoint of demand, by the way, is that certain large converters have taken the stand that "goods produced by a mill that is running day and night are not so good as merchandise that is run in the day time only."

More Discussion on Worker Protection

UNEMPLOYMENT INSURANCE continues to brook large in the discussion of industrial matters and it takes varying turns. We can readily believe that unemployment insurance, as constituted in the dole system, comprises a mortal danger and cannot long be maintained at the current figure of $750,000,000 annually. The dole system which puts a premium on idleness, as the evidence seems to indicate for Great Britain, is not protection for the worker from emergency loss of employment due to necessary adjustments because of the progress of industry or such losses as are incident to changing demand and similar factors.

Meantime unemployment insurance on a different basis has many advocates and some objectors in this

country. On the one hand, we hear of a proposition in Massachusetts for legislation authorizing the issuance of group unemployment insurance policies, broached by the State Department of Labor and Industries. The plan would cover a group of not less than 50 workmen against loss of salary after continuous employment of not less than a year, premium payments to be made jointly by employee and employer, or by the latter alone. On the other hand, opponents of the idea say that such a depression as we have just had would make necessary prohibitive premium rates or unbearable taxes, according to whether the insurance were by private companies or through the Government.

In all revolutionary steps of industry, there have been men of vision who have overridden old theory and proved that things could be done differently. One cannot say that the opponents of unemployment insurance are wrong, but the argument about the burden thereof in times of depression might be met by the counter argument that protection of the sort contemplated naturally would lessen the severity of unemployment and consequent loss of purchasing power in such times. In fact this kind of insurance, says one prominent manufacturer, must be considered in the formulation of preventive measures against repetition of business depression. The practical working of such schemes to date, as revealed in a recent survey of Industrial Relations Counselors, Inc., shows that the idea is at least being put to the test.

Demand to Dominate Supply

AMONG SUGGESTIONS of a leading bank at the start of what is considered a sure turn at last toward better times, in which demand will dominate rather than a burdensome supply in an overwhelmingly buyers' market, is that "since we now realize that there never will be a new era in which the basic laws can be violated without the inevitable penalty, it may be well to consider the establishment of sign posts or danger signals which will serve as a guide when business becomes vigorous and speculation rife." This same bank suggests also a plan for consumers which extends the idea of protection against dull times in employment. "We may conclude," it says, "that it would be desirable for consumers, instead of indulging in over-spending in times of prosperity, to build up as have the corporations for the past few years, a reserve which tides them over a lean period."

Thus we come back to the idea of prudence, albeit in this instance for the individual and consumer rather than the producer and business. Unfortunately the individual is hard to educate, especially when things are going along swimmingly. And if there is a new generation of business which must have its baptism of fire in depression, there is apparent even in the older fry a tendency to listen to a bally-hoo of false optimism; at least, the experience of last year indicated a trumped-up condition of hope without any solid foundation, the final result of which was to create a depressed attitude, undoubtedly intensified when business men realized the bald facts. The skeptics became legion. Depression probably was protracted rather than helped by the optimists.

But if the facts were contrary to so many statements of broad observers, those directly with facing the truths of the situation as felt vitally in their industrial affairs can also weigh the outlook from the unquestionable signs of statistical conditions. The cotton industry has known for some months that it was in a position statistically to go ahead profitably, so soon as demand began to advance toward normal. All it needs now is assurances from outside that the tide has turned definitely in the automobile, tire and other industries directly affecting cotton processes and in business affecting the general public purchasing power.

What the Southern Mills are Doing

THE CLARK THREAD CO., of Newark, N. J., has announced plans for the establishment of a southern plant in Cobb county near Austell, Ga., conditional upon the satisfactory closing of options upon a site of approximately 1,000 acres. The Clark Thread Company is one of the largest concerns manufacturing thread, under the widely known trade name of "Clark's O. N. T. Thread". J. E. Sirrine & Co., of Greenville, S. C., have been selected as engineers in charge of designing and supervision of construction of the new plant.

Fitzgerald Cotton Mills, Fitzgerald, Ga., recently installed 24 Stafford looms of 90-inch width.

Mill No. 4 of the Pacolet Mfg. Co., New Holland, Ga., is moving the machinery of two picker rooms to the third floor and will fill one picker room with spinning frames to enable the plant to dispense with night spinning.

It is stated that the Chamber of Commerce, Gastonia, N. C., is negotiating with an eastern weaving company for establishing a weaving mill in Gastonia.

Clyde Mills, Inc., of Newton, N. C., have taken a long lease on the Martel Mill at Elk Mountain, N. C., and have already opened the spinning room, with other departments to be opened as soon as new machinery is installed.

American Cotton Mills, Plant No. 1, Bessemer City, N. C., have intalled three winders and plan to install another soon. They are changing from tire fabrics to yarn.

The Commander Mills, Inc., Sand Springs, Okla., have announced that they will install water treatment equipment.

Laurens Cotton Mills, Laurens, S. C., have placed contract with Bahnson Co. for Bahnson humidifiers to be installed in their mill at an early date.

It is reported that 22,000 additional spindles are being installed at the Winnsboro Mills, Winnsboro, S. C. This is a plant of the United States Rubber Co. The extension brings the total number up to 100,000.

The Kendall Mills will build 61 residences, 23 at the Paw Creek, N. C., plant and 38 at the Newberry, S. C., plant at a cost of $2,500 each. Lockwood Greene Engineers, Inc., will be in charge of the work.

The Pinehurst Silk Mills, Inc., Hemp, N. C., recently acquired by J. Spencer Love and associates of Burlington, N. C., are installing 96 new Stafford 48-inch silk looms and a new Cocker high speed warper and creel, making a total of 192 looms in operation.

Sale of Delgado Mill, Wilmington, N. C., to the Seaboard Public Service Co., of Alexandria, Va., has been approved, it was recently announced. The new owners will make emergency repairs to the mill village and install additional machinery, etc., at a cost of $340,000. George E. Spofford, of Augusta, Maine, will have supervision of the property.

Burlington Mills, Inc., Burlington, N. C., are installing additional equipment, including: four 52-inch shuttle changing rayon looms, and 34 48-inch 2x1 box type silk looms, all from the Stafford Co.; also, 54 slightly used 44-inch Crompton & Knowles Gemhead 2x1 silk looms.

Rudisill Spinning Mills, Lincolnton, N. C., have recently installed "Breton Minerol" process equipment for oil spraying cotton in their mills. It is of the latest high pressure type. This equipment has also been installed in the Patterson Mills Co., Rosemary, N. C. The equipment was furnished by Borne Scrymser Co., of New York.

TEST ON CONTINUOUS STRIPPING SHOWS POSITIVE SAVING IN STOCK

A NORTHERN MILL installed a Saco-Lowell Continuous Stripper on a test card and compared results with a nearby card not so equipped. The test figures proved conclusively the value of the modern equipment.

Running 100% waste cotton from their own card strips or similar stock purchased outside, the Saco-Lowell equipped card produced but 2¼ ounces of cylinder strips after 280 hours' running. The ordinary card produced 10¾ ounces of strips at each stripping and it had to be stripped 4 times daily. At this rate each of the old cards was turning in 780 lbs. of strips a year to be sold at a loss. Small wonder that, with such savings at their command, mills are fitting their card rooms with this automatic stripper.

How many cards have you got at work producing strips?

SACO-LOWELL

MANUFACTURERS OF TEXTILE MACHINERY

147 MILK STREET, BOSTON, MASS.

Charlotte, N. C. Spartanburg, S. C. Atlanta, Ga.

INSTALL CONTINUOUS STRIPPERS AND GET SUBSTANTIAL COST REDUCTIONS REPORTED BY LEADING MILLS

Cotton Comment

New Orleans, January 14th, 1931.

AFTER SELLING DOWN to the lowest prices reached thus far this season and since 1915 the cotton market recovered somewhat, but some realizing of late caused values to ease again. However, compared with about one month ago Middling in New Orleans is quoted today at 9.73 versus 9.20, which is a rather good showing considering the small exports, light mill takings and disappointing consumption.

Domestic and British textile returns for December were rather discouraging, but the unemployment situation and advices from the auto and steel industries show improvement since the opening of the new year, which was encouraging for general business. On the other hand there were labor troubles in Lancashire, political distubances in India, and the price of silver dropped to the lowest level in history, but hope is entertained that there may be a satisfactory settlement of the labor troubles in Lancashire and in the political situation in India, and, perhaps, a recovery in the value of silver.

ASSOCIATION OF COTTON TEXTILE MERCHANTS OF NEW YORK DECEMBER STATISTICS

Yards—	December 1930 5 weeks	November 1930 4 weeks	December 1929 4 weeks
Production	234,052,000	206,633,000	243,735,000
Sales	182,656,000	183,067,000	302,934,000
Shipments	226,951,000	200,661,000	214,148,000
Stocks	363,962,000	356,861,000	461,013,000
Unfilled orders	288,956,000	333,251,000	431,018,000

December sales of domestic cotton goods were 78.0 per cent of production as against 88.6 per cent in November this season and 124.3 in December last season. Shipments were 97.0 of production as against 97.1 in November this season and 88.0 in December last season. Stocks at the end of December increased 2 per cent against an increase in November this season of 1.7 per cent and an increase in December last season of 7.0. Unfilled orders end of December decreased 13.3 per cent against a decrease in November this season of 5.0 and an increase in December last season of 26.0.

AVERAGE RAINFALL IN TEXAS, IN INCHES

Year—	1930	1929	1928	Normal
December	1.93	1.69	2.72	2.16
Nov. and Dec. inc.	4.61	4.79	5.34	4.50

CENSUS REPORT

United States—Bales—	This season	Last season
December consumption, lint	406,207	452,685
December consumption, linters	43,989	52,152
December consumption, inc. linters	450,196	504,837
Consumption, lint, 5 months	2,012,244	2,738,185
Consumption, linters, 5 months	284,750	363,815
Consumption, inc. linters, 5 months	2,296,994	3,102,000
Mill stocks, Dec. 31st	1,659,432	1,841,079
Stocks in public Storage & whs. Dec. 31st.	8,377,720	5,898,596
Mill stocks, stocks in pub. stg. & whs. Dec. 31st	10,037,152	7,739,675
Active spindles during December	25,525,820	29,047,030
Active spindles during November	25,858,016	29,739,920

The foregoing trade statistics represent or reflect the business depression, especially of the first part of this season, but better results are probably in store for the future. There appears to be a more cheerful feeling in Wall Street, and the general impression is that there will likely be a slow and gradual improvement in general business conditions as the new year grows older. In the previous review it was stated that it is possible that prices then were about scraping bottom. Recent developments lend color to this belief since values show some recovery subsequently. The fact is that prices for raw material are comparatively cheap, as is money, that there is a surplus of labor, while inventories of goods are reported low. All of which should make for increasing activity in manufacturing centers, and if realized, should make for more active trading and probably a higher market.

Exports from the United States, including Canada, for week ending January 9th, were 182,500 bales versus 186,300 for corresponding period of last season, since August 1st, 4,189,200 against 4,505,600.

SPINNERS' TAKINGS OF AMERICAN COTTON, AUG. 1 to JAN. 9

Bales—	This season	Last season
Southern Mills	2,591,000	3,214,000
North and Canada	779,000	1,162,000
Foreign mills	2,952,000	3,518,000
Total since Aug. 1st	6,322,000	7,894,000

According to Secretary Hester the world's visible supply of cotton on January 9th was as follows:

Bales—	This year	Last year
American	8,382,081	6,427,664
Other kinds	2,160,000	2,219,000
All kinds	10,542,081	8,646,664

Recently Washington advised: "The 1930 world cotton crop was estimated today by the Department of Agriculture at 26,400,000 bales of 478 pounds net as compared with 26,300,000 bales produced in the season beginning August 1, 1929.

"In its report the department pointed out that the crop this year is only 2,000,000 bales less than in 1926 when the largest crop on record, 28,400,000 bales, was grown.

"The crop in Russia was reported as the largest on record with 1,950,000 bales this season as against 1,351,000 bales last season.

"The production in practically all countries other than the United Sattes and Egypt was reported to have shown an increase this year over last. No estimate was available for China, but advices from the foreign agricultural information service in Shanghai are to the effect that prospects are for a larger crop in that country than a year ago.

"The total acreage planted this season was estimated at 82,300,000 acres for all countries, excluding China, an increase of 400,000 acres over last season's area."

While the world's visible supply of American is much larger than it was at this time last year, and while the production in practically all countries other than the United States and Egypt was reported to have shown an increase this year over last, it is noted that the world's visible supply of foreign cotton on January 9th was somewhat less than on corresponding date last year, whereas the price is so much lower than one year ago, which are features worthy of attention.

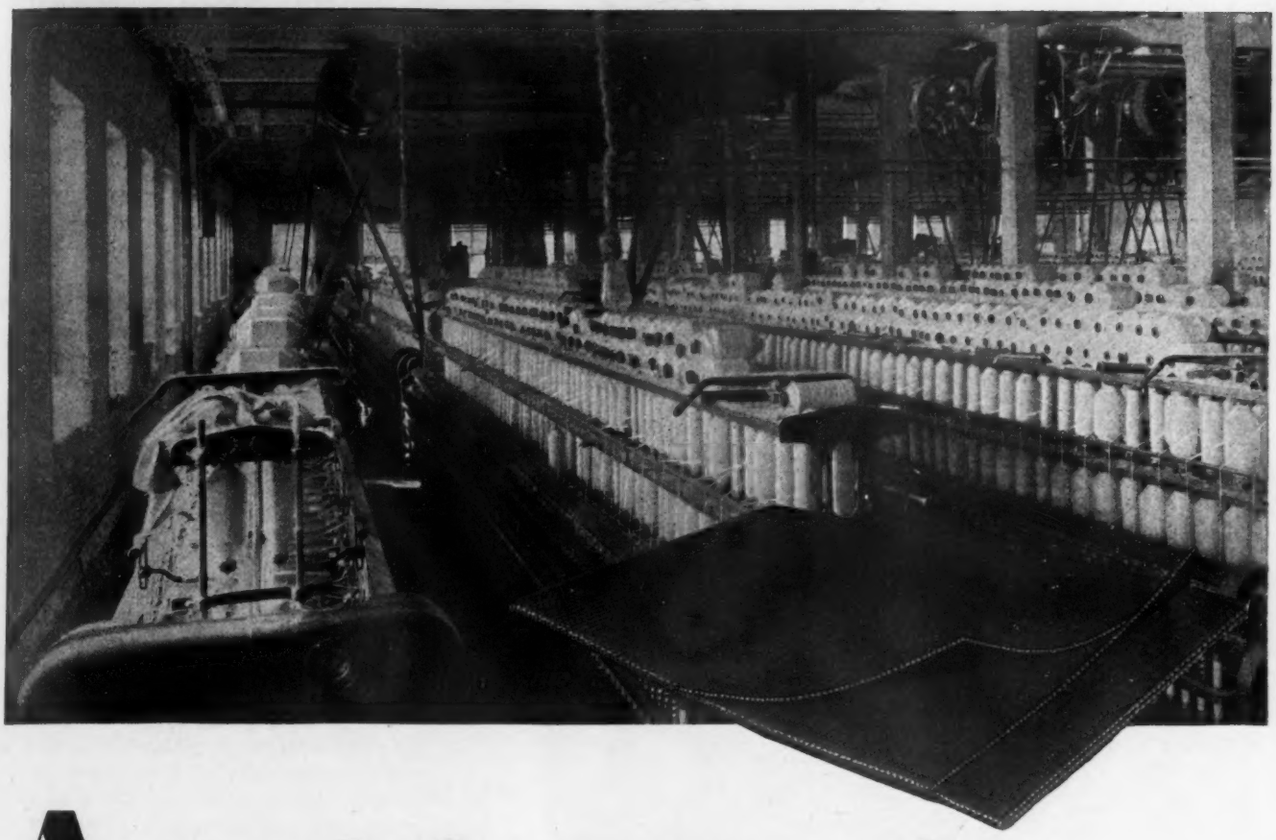
The weekly trade reviews indicate that the seasonal expansion of activity after the year-end shutdowns had thus far fulfilled the more optimistic expectations, due mainly to some revival in the auto and steel industries and improvement in the unemployment situation. In this week's review Iron Age estimates production at 44 per cent of capacity, a rise of 3 per cent in the week. Late advices from New York indicate that the trend of consumption of steel is up and neither producers nor comsumers have any stocks, but it is more clearly recognized that progress will be made slowly.

Reference to the major industries of the country, such as the steel and auto business, is made for the purpose of following developments in these two great industries of the nation, as improvement in these lines of trade have a marked effect on sentiment, and are looked upon as barometers that indicate the probable future trend of general business.

Recent New York press advices stated in part: "The cotton textile industry has entered the new year on a much sounder basis than a year ago, with sales and shipments generally above actual production, George A. Sloan, president of the Cotton Textile Institute, said today. He pointed out that stocks, too, were lower than on January 1, 1930, and even below the levels of two years ago."

Meanwhile the campaign for an important decrease in this year's acreage is getting under way, and this feature of the situation will probably attract more attention as the planting season approaches since the slogan of the South this year will likely be "diversify—raise less cotton and grow more food and feedstuffs, etc."

While comparatives for thus far this season were disappointing, exports of raw cotton from the United States, spinners' takings and world's consumption of American during the remainder of the season will probably make a better showing compared with after this time last season.



A new belt construction for hardest textile service

The unique construction of the new Goodyear Thor Belt, seamless*—permits hard wear on edges without fraying out. A wrap envelope—which also helps carry load—encloses the carcass built up of plies, and rigidly armors the edges from damage in shifting. There is no center seam—Thor Seamless is guarded alike from splitting and from fray. It is made of heavy silver-duck—strong at the fasteners—cushioned, and staunchly buttressed with rubber. This is the rugged belt you have needed for frames, looms, spoolers, twisters—a belt for dependable drive service under all conditions of work.

With other Goodyear products for textile mills, Goodyear Thor Belting, seamless, is carefully applied to your work by the G.T.M.—Goodyear Technical Man. He specifies Goodyear Compass (Cord) Textile Endless Belts and Goodyear Emerald Cord Multiple "V" Belting to the requirements of your own machinery. He supplies flexible Goodyear Wingfoot Air Hose for long wear in clean-up service.

• • •

The G.T.M. saves you time and costs—to see him, just write to Goodyear, Akron, Ohio, or Los Angeles, California.

**Goodyear Thor Belting, seamless, is made in widths up to and including 16"—Thor quality of special construction is available for larger sizes*

THE GREATEST NAME IN RUBBER

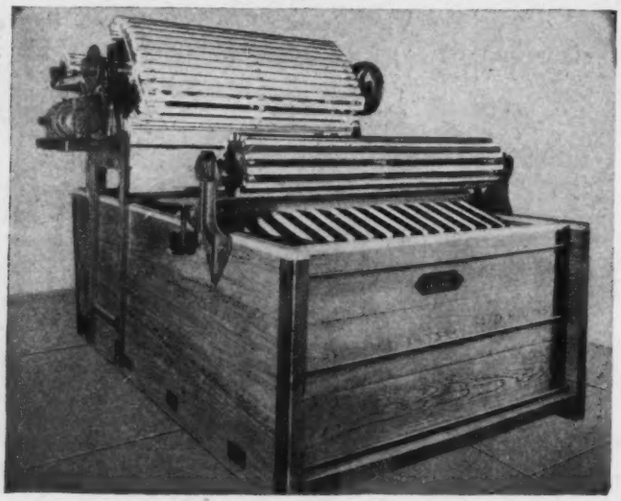
GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING

New Textile Equipment and Publications

RODNEY HUNT SILK DYE BECK.

Rodney Hunt Machine Company, Orange, Mass., have introduced a new modern dye beck designed particularly for silk and rayon. This machine is shown in the accompanying illustration. The new beck, the manufacturers point out, has anti-friction bearings throughout, each bearing encased in a water and grease-proof housing. The drive is by direct electric motor through worm and gear reducer and roller chain, the motor drive equipment being mounted considerably above the top of the tub. This feature, it is explained, puts the motor out of the way of dampness and moisture due to splashing. The roller chain drive from the worm gear reducer to the reel shaft provides easy and convenient means of changing reel speeds without having to change the ratio of the reducer itself, it is stated. The counterbalance stop motion can be set for light action, and operates through electric switch to stop the motor in case of a tangle.



New Silk Dye Beck . . .

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DO YOU KNOW STITCHES?

"Do You Know Stitches?" is the title of a booklet that has just been published by the Union Special Machine Co., 400 North Franklin Street, Chicago. It presents in concise and simple form a complete description of stitch formations and a summary of their merit with regard to strength, elasticity, security, waterproofness, thread consumption, and unraveling.

FRAME FACTS.

Steel Heddle Mfg. Co., 2100 Allegheny Ave., Philadelphia, Pa., recently published three pamphlets, each entitled Frame Facts. One pamphlet gives descriptive information concerning frames for plush and velvet weaving, another information pertaining to frames for wool and worsted weaving, and still a third information about frames for cotton, silk and rayon weaving.

NEWPORT DIRECT FAST SCARLET 3B.

Bulletin No. 212 describes the dyestuff "Newport Direct Fast Scarlet 3B", which was recently placed on the market by Newport Chemical Works, Inc., Passaic, N. J. All of the properties of the new dye are given. Bulletin No. 211 describes Newport Direct Yellow GR.

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BALL BEARING LIFTING MACHINES.

The Economy Engineering Company, 2653 West Van Buren Street, Chicago, recently announced a new line of ball bearing equipped lifting machines. Both hand and power operated, plain and telescoping machines are included in the new development.

Ball bearings, in these new models, it is stated, are used throughout the gearing and in the sheave and platform frame wheels. On the Telescopers the sliding frame wheels are also equipped. It is also stated that friction is further reduced through recently designed flangeless guide wheels which are used to support the platform and telescoping frames. The company points out that these two features increase the efficiency of the machine 25 per cent.

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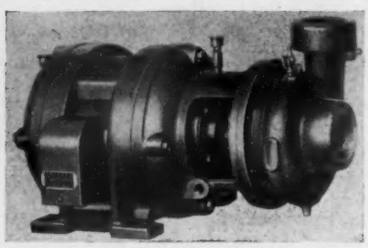
"JFS" SPEED CHANGER WITH BUILT-IN MOTOR.

Stephens-Adamson Mfg. Co., Aurora, Ill., have announced the development of a new compact variable speed reducer, which consists of a variable speed reducer, electric motor and control entirely contained in one housing.

This new drive consists of a standard "JFS" variable speed reducer mechanism with the housing re-designed to take the body of an electric motor of standard make. The motor armature shaft is extended and forms the high speed shaft of the speed changer. To replace the hand wheel normally used to increase and decrease the output speed of the transmission, a bevel gear is used, which is turned in either direction by means of a bevel pinion inside the housing and the small hand wheel mounted on the top of the unit. In operation, it is pointed out, the speed changer section of the drive resembles fundamentally the action of a large roller bearing in which the races and rollers are ground to special shapes. The power is transmitted by the traction between the polished steel surfaces of rollers and races. The motor shaft rotates two inner races, which contact with three double conical rollers, causing them to rotate slowly in planetary fashion inside the two outer races which are held from rotating.

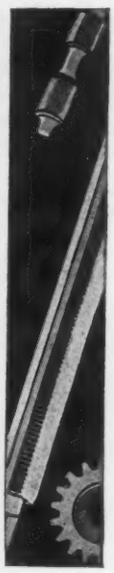


New Speed Changer.

The three planetary rollers drive a spider keyed to the variable speed shaft. Change in speed is secured by turning the hand wheel, which moves the two outer races nearer or farther apart on the longitudinal axis. As the two outer races approach each other the three rollers are forced nearer the center and in turn force the two inner races apart against heavy springs which maintain the necessary tractive pressure between surfaces, it is explained. The mechanism is entirely enclosed and operates in oil. The new drive is available in sizes to deliver ¼ to 7.5 h. p., and the manufacturers state that with a 1200 r.p.m. drive mo-

COSTS CUT

BY USING H&B REPLACEMENT PARTS



WE strongly urge that you use only H & B Replacement Parts in reconditioning your H & B Equipment. They promise lowest ultimate cost, reduce necessity for frequent repairs and keep equipment functioning at highest efficiency.

No round-the-corner shop or jack-of-all-trades can duplicate H & B parts. Our modern equipment, automatic machines, metallurgical specifications and standards of accuracy assure fit and continued trouble-free operation. When ALL costs are accurately figured, you will find H & B parts cheapest and best.

H & B AMERICAN MACHINE CO.

PAWTUCKET, RHODE ISLAND

BOSTON OFFICE
161 Devonshire Street

ATLANTA OFFICE
815 Atlanta Trust Co. Bldg.

· USE ONLY H & B PARTS IN H & B EQUIPMENT ·

tor a variable speed range of from 120 to 720 or 24 to 144 r.p.m. is practicable.

The unusual compactness of the drive, since the motor is an integral part of it, is among the chief features pointed out in connection with the drive by the manufacturers.

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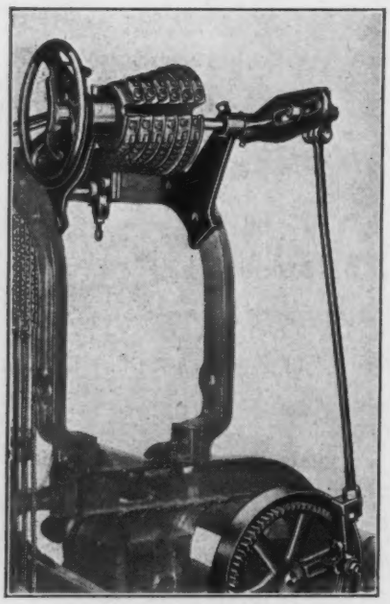
NEW CONE MOTION FOR SILK LOOM.

The Stafford Company, Readville, Mass., has recently announced a new cone motion for silk looms. Its most important new feature is a harness level-



New Silk Loom Cone Motion.

ling adjustment so arranged as to be in easy reach of the operator at the front of the loom. The resetting of harness is accomplished by means of a large hand wheel at the front of the loom, the wheel being large and accessible so that little strength is needed to reset a large number of harnesses to their normal position.

:: :: ::

SQUARE D SAFETY PANEL BULLETIN.

The Square D Company, Detroit, Mich., recently issued a new bulletin on its Safety Panel (convertible.) Copies of this new bulletin may be obtained by addressing communications directly to the advertising department of the company.

:: :: ::

PONSOL BLUE BCL.

Ponsol Blue BCL, a new dye which is being offered both in the form of a powder and a double paste by E. I. du Pont de Nemours & Co., Inc., yields reddish shades of blue and remarkable fastness to light, washing and chlorine, the company states.

It is further pointed out that its shade is similar to that produced by Ponsol Blue BCS Double Paste, but distinctly superior fastness and working qualities are to be observed in the newer product. This new vat dye is described in bulletin No. E. 441.

:: :: ::

NEW CATALOG ON CHAIN HOISTS.

David Round & Son, of Cleveland, Ohio, recently issued a very attractive catalog giving information concerning chain hoists, trolleys and winches. The catalog, which is No. 61, includes not only prices and descriptions of this equipment, but also data on the choosing of a hoist, data on beams and channels, on maximum distance between supports, and on chain. Repair parts are also listed.

:: :: ::

A NEW BOOKLET ON LEATHER BELT MAKING.

"Tension Cementing" is the title of a booklet recently issued by Graton & Knight Company, Worcester, Mass., on the process of leather belt making. The booklet gives a very complete description of this new process.

:: :: ::

BOOKLET ON INDUCTION MOTORS.

Reliance Electric & Engineering Co., Ivanhoe Road, Cleveland, Ohio, have published a very interesting and instructive booklet on Type AA Reliance Induction Motors with ball bearings for two and three-phase alternating-current circuits. The bulletin is No. 109.

:: :: ::

NEW DYESTUFFS.

Ciba & Cibanone Dyestuffs on Silk and Clorantine Fast Dyestuffs on Silk are described by Pattern Cards Nos. 722 and 668, respectively, of the Society of Chemical Industry in Basle. Ciba Co., Inc., Cedar and Washington St., N. Y., are representatives for the Society in this country.

:: :: ::

NEW WESTINGHOUSE GENERAL CATALOG.

The Westinghouse General Catalog, 1931-32, comprised of 1352 pages presenting descriptions and illustrations of apparatus representative of the myriad products manufactured and sold by the Westinghouse Electric and Manufacturing Company, has been announced recently by that company.

Committee D-13, made up of consumers, producers and general interests, is in a position to develop specifications acceptable to all interests concerned, it is pointed out. Its specifications are used generally and are accepted as standard. They furnish a common basis for comparison of materials which is a decided advantage to both producer and consumer. The committee is actively engaged along the lines indicated and expects soon to include wool and worsted, silk and jute materials, in its work.

:: :: ::

NEW TYPE PUMPING UNITS.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., have recently published a new bulletin, No. 1647, on their Type "SSU" Centrifugal Pumping Units. It is pointed out in the bulletin that, in contrast with the ordinary small single suction pumps driven by standard motors, the pump and the motor have been designed as a complete unit and not simply tied together by means of a coupling.

:: :: ::

NEWPORT FAST ACID RED SWB.

Possessing very good fastness to light and fulling, and excellent fastness in most other important particulars, Newport Fast Acid Red SWB is valuable for dyeing wool or worsted yarns for bathing suits, sweaters and carpet yarns, as well as for silk, both pure dyed and tin weighted, are claims made for this new product of the Newport Chemical Works, Inc., Passaic, N. J., by the company. They also point to the fact that it dyes almost as strong from neutral as from acid baths and leaving cotton and rayon effects only slightly stained, it finds extensive use for dyeing mixed goods with cotton or rayon for novelty effects as well as a shading color for the animal fibers in the production of solid shades.

:: :: ::

PAMPHLET ON LONG DRAFT.

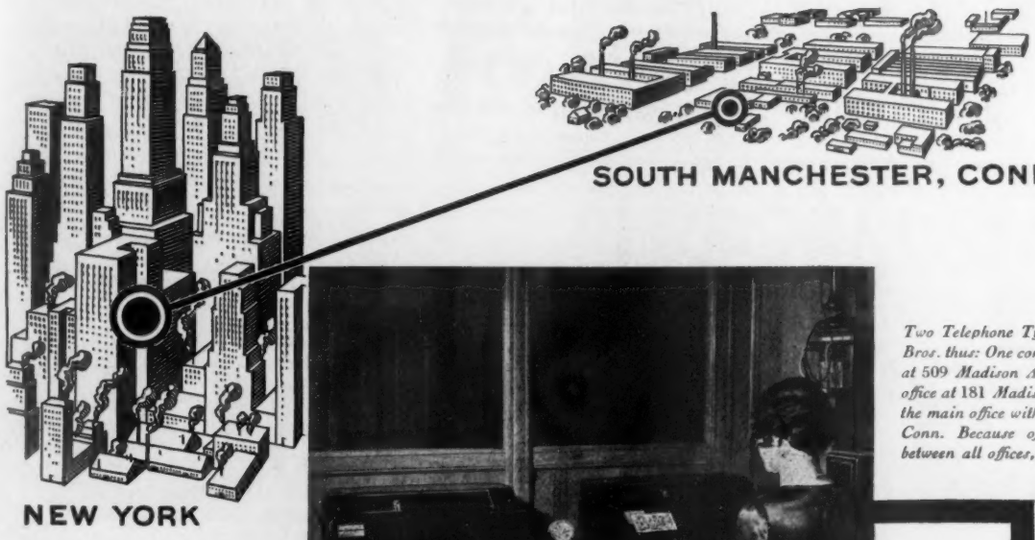
Whitin Machine Works, Whitinsville, Mass., recently issued a very attractive folder which adequately describes their Casablancas system of long draft spinning. The folder tells what it is and what it does.

:: :: ::

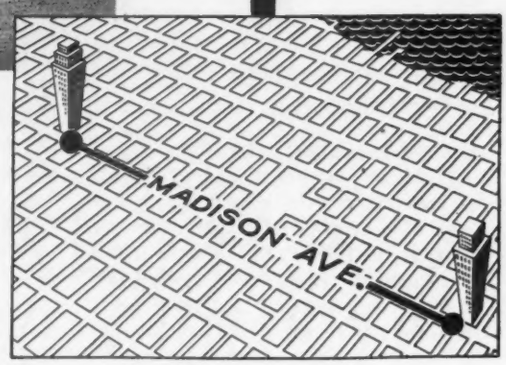
NEW RECORDING INSTRUMENT.

A new circular chart recording instrument, identified as Type A, has been announced by the Westinghouse Electric and Manufacturing Co. The company states that these instruments are light and small, that they include ammeters and voltmeters, and are made for switchboard mounting or as portable instruments.

The company mentions that these instruments have numerous applications in industry, and an example of their utility is their use for determining the most economical use of motor-driven machinery, the loading of motors, time of starting in mornings or after lunch



Two Telephone Typewriter circuits serve Cheney Bros. thus: One connects the upholstery sales office at 509 Madison Ave., New York, with the main office at 181 Madison Ave., and the other connects the main office with the mill at South Manchester, Conn. Because of the instant communication between all offices, deliveries are greatly speeded.



TELEPHONE TYPEWRITERS

MAKE POSSIBLE EXCEPTIONALLY PROMPT SERVICE TO CUSTOMERS

TODAY service is an important factor in the selling of textile merchandise. Ordering more frequently and in smaller quantities, customers want almost immediate delivery. Many firms in the industry use Telephone Typewriters* for quick communication between their offices and mills.

Cheney Brothers, noted silk company, is able in this way to give its customers exceptional service. It connects its two offices in New York City and its mill in South Manchester, Conn., by this modern means of communication.

Messages of the most complicated nature are transmitted in typewritten form. General information—departmental matters are handled with speed and accuracy. Orders—instructions to the mill as to the type and quantity of goods to be manufactured. Advices as to the material needed in New York. Shipping instructions. Confirmations.

An official says: "By using Telephone Typewriters we are able to save at least a day in filling orders from the mill. We can give complete manufacturing information as soon as an order is received, or have the goods shipped immediately from the South Manchester warehouse."

Telephone Typewriters effect many production and distribution economies. Why not have a representative visit your office to give you further information about them? Just call the Business Office of your local Bell telephone company.

* * *

**Telephone Typewriters transmit typewritten messages instantly and directly between the separated offices of a business firm. Each message is reproduced exactly as it is typed. Telephone Typewriters are installed and maintained by the Bell Telephone Company; they may be had on contract for any number of hours each day from one upward. They send and receive as many as 60 words a minute.*

hour, time of quitting, loss of time, and power required for different operations or depth of cuts.

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THE FINE ART OF WEAVING RAYON.

The Fine Art of Weaving Rayon, is the title of a pamphlet recently published by the Stafford Company, Readville, Mass.

In the pamphlet it is stated that the fine art of weaving modern rayon fabrics at a profit centers upon the following three factors: (1) Automatic weaving, as near to 100 per cent loom capacity as possible. (2) The production of first quality fabric. (3) Production obtained at low cost.

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IMPROVED RAYON SPINDLE MOTOR.

A new improved spindle motor for high-speed rayon pot-spinning has been announced by the General Electric Co., Schenectady, N. Y. The motors are available in three sizes, depending upon the required load and operating speeds, and are liberally rated, it is pointed out. It is said that the motors are operated successfully at speeds as high as 10,000 r. p. m.

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A NEW BEARING METAL.

According to recent announcement, an amazing new bearing metal in the form of a self-lubricating bearing has been invented by W. C. Wilharm of the Westinghouse Research Laboratories. It has been estimated that these bearings are ten times as efficient as the so-called "oil-less" bearings in use today.

It is pointed out that this new bearing can be used with lubricants instead of the present oil-requiring bearing materials. It is also added that if the supply, or film, of lubricant should for any reason become inadequate, this bearing is capable of resisting the heating action of friction for a considerable time by means of its own lubricating qualities.

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RAYON WARP SIZING.

The "Why" of Successful Rayon Warp Sizing is the title of a pamphlet recently published by Van Vlaanderen Machine Company, Patterson, N. J. The pamphlet tells of the improvements recently made by the company in their rayon warp sizing equipment. These pamphlets will be sent to anyone making request to the aforementioned company.

:: :: ::

FORMIC ACID.

Victor Chemical Works, Chicago, recently issued a very interesting booklet entitled, Formic Acid, which they are distributing with their compliments to those interested in the use of formic acid.

They state that among the many topics discussed are the following: the economy features of Formic acid; action of acids on cotton and rayon; matching old samples; preventing unevenness in fast color work; and dyeing French spun yarns.

The company states that while the booklet is very comprehensive in its subject matter, it is concise and to the point.

NEWS ITEMS *with a Textile Slant*

MERGER ANNOUNCED.

Announcement has been made of the merger of the Southeastern Machine Co., of Atlanta, Ga., and the Greenville Spindle & Flyer Co., of Greenville, S. C., to be operated in the future as the Southeastern Machine Co. In line with an expansion program of this concern, an addition has been built to the Greenville plant. This concern does general overhauling of all kinds of textile machinery and the re-working of steel rollers, spindles and flyers.

George F. Andrews, president of the Greenville Spindle and Flyer Co., will be president of the Southeastern Machine Co. He was for twenty years connected with Saco-Pettee and Woonsocket Machine and Press Co., before establishing the present business.

:: :: ::

STYLE.

National Silk Dyeing Company substantiates its claim to style interpretation and the ability to cope with unusual demands in fabric processing, by co-operating with exhibitors at the G. R. A. January style show, according to recent announcement by the National Silk Dyeing Co. The company states that they processed the material for four of the smart costumes shown; namely, those by Bemberg, Corticelli, Belding-Heminway, and L. & E. Stirn.

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TEXTILE ECONOMIST CHANGES NAME.

The "Textile Economist," monthly bulletin of the Tubize Chatillon Corporation, reviewing the textile trade conditions, has announced a change in name to "Textile Organon" in order to avoid its confusion with other publications of similar name in allied trades. The word "Organon" is a latin word, meaning an organ or medium of thought and knowledge along a philosophical or scientific line.

In addition to reviewing the various divisions of the textile trade—cotton, wool, silk, rayon, textile fiber consumption—and the hosiery and underwear trade, the "Textile Organon" also analyzes general business conditions.

:: :: ::

MANUALS ON GARMENT MANUFACTURE.

Limited editions of the manuals on the manufacture of shirts, knitted underwear, and athletic underwear are available to those interested, according to an announcement from Union Special Machine Company, 400 North Franklin Street, Chicago. These manuals are handbooks covering the entire process of manufacture, and have been prepared by the engineering department of the Union Special Machine Company. Descriptions of seam construction are given, together with production systems, factory layouts, information on sewing operations, equipment, and records.

The manual on the manufacture of shirts is a separate volume while the knitted undergarment manual and the athletic underwear manual are combined in one volume. Copies of either or both will be sent to anyone in the needle trades on request to the company at the Chicago office.

:: :: ::

NEW SELLING AGENTS APPOINTED.

Perkins and Boland, Incorporated, 99 Chauncy Street, Boston, Mass., have been appointed New England selling agents for the Dixie Mercerizing Company, of Chattanooga, Tenn., one of the largest manufacturers of Durene yarn. Perkins and Boland have been engaged in the selling of yarn to the New England trade for about 25 years.

:: :: ::

COTTON CLOTH FOR ADVERTISING.

Along with quite a number of other concerns, the district office of the S K F Industries, Inc., 598 Peachtree Street, N. E., Atlanta, Ga., of which N. Miller is the manager, recently utilized cotton cloth as a means of advertising, by sending out, to some six thousand cotton mills an advertisement printed attractively on cotton cloth, announcing the service available at the S K F headquarters in Atlanta.

EXPECT NEW COUNTER PERFORMANCE AND EFFICIENCY . . .

Here is a new pick counter with an old name that attains new heights of performance. The efficiency of counting equipment has never been so great.

Cotton mill men are welcoming this new device because of the greater assurance of accuracy.

They are now able to enjoy the outstanding advantages in pick counters that were previously lacking. The modern

WALTHAM PICK COUNTER

—with the Waltham degree of efficiency—is enough to set this pick counter in a class by itself but the Waltham Company has gone farther than that. They designed a unit to record day and night shifts independently, for a separate check-up on each group of operators. They put into it correct construction features that enable it to withstand the stress of the most severe vibration—thus eliminating excessive repairs and replacements.

One mill in New England installed 5000 Waltham Pick Counters —and are enthusiastic over the results. Write for literature that describes the features and advantages of this new counter. No obligation.

Manufactured by the

WALTHAM WATCH COMPANY

WALTHAM, MASSACHUSETTS

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

A. E. Massey recently resigned as general superintendent of the Thomaston (Ga.) Cotton Mills to accept the position of superintendent of Exposition Cotton Mills, Atlanta, Ga., succeeding J. W. Hames.

N. L. Whitten, who has been superintendent of the Peerless Cotton Mills, Thomaston, Ga., has accepted the position as superintendent of the Thomaston Cotton Mills, Thomaston, Ga.

W. D. Massey, who has been overseer of carding and assistant superintendent of the Thomaston Cotton Mills, has accepted a position as superintendent of the Peerless Cotton Mills, Thomaston, Ga.

G. A. Gatlin, who has been overseer of carding at the Peerless Cotton Mills, has accepted a position as overseer of carding at the Thomaston Cotton Mills.

C. O. Kinsler, overseer of spinning at the Peerless Cotton Mills, has charge of the carding of this plant, also.

C. T. Mote has resigned as superintendent of twisting at the Martha Mills, Thomaston, Ga., to accept the position of overseer of weaving of the Thomaston Mills.

Ed. S. Kempton, who has been connected with Mill Devices Company, Inc., for the past several years, has returned to Gastonia, N. C., in the capacity of sales manager and will make headquarters in the knotter factory from now on.

Leon W. Campbell has become associated with the H. & B. American Machine Company, in charge of development work at the company's plant in Pawtucket, R. I. A number of years ago, Mr. Campbell was for a long time general manager of the Woonsocket Machine & Press Company of Woonsocket, R. I., and within recent years has filled other positions in various phases of the textile industry.

C. C. Harding has joined the sales force of George B. Pfingst, Inc., manufacturers of silk yarns for knitters. He will devote his time to the southern knitters and will have his office at Charlotte, N. C.

S. R. Power recently resigned as superintendent of the Langley Mills, Langley, S. C.

E. N. Darrin.

Erwin N. Darrin, of Hopedale, Mass., vice-president and assistant agent of the Draper Corporation, is moving to Spartanburg, S. C., where he will have general charge of the southern business. Walter M. Mitchell will continue in charge of the Atlanta, Ga., office and Clare H. Draper, Jr., will continue in charge of the Spartanburg office.

Harold L. Wheeler, who for the last 15 years has been connected with the bleachery of the Nashua (N. H.) Mfg. Co., is now superintendent of the bleaching department of the Oconee Mills, at Athens, Ga.

W. R. Tattersall, formerly superintendent of the Langley Mills, Langley, S. C., recently accepted the position as superintendent of the Eagle & Phenix Mills, Columbus, Ga.

L. J. Hill, who has been superintendent of the Shoaf-Sink Hosiery Mills, Lexington, N. C., for the past 10 years, recently resigned this position to accept a similar position with the Maurice Mills, Thomasville, N. C. He succeeds J. M. Hayes, who recently resigned.

J. M. Lee, formerly of High Shoals, N. C., has accepted the position of overseer of weaving at the Massapoag Mills, Lincolnton, N. C.

R. M. Ross recently resigned his position as overseer of carding at the Palmetto Mills, Columbia, S. C., to accept a similar position with the Clyde Mills, Newton, N. C.

S. D. Boyd, was recently promoted to overseer of spinning at the Arcade Cotton Mills, Rock Hill, S. C.

M. J. Bates has resigned as overseer of the cloth room at the Sylacauga plant of the Avondale Mills, Sylacauga, Ala.

David Tousignant, who until recently was superintendent of the Langley Mills, Langley, S. C., is now superintendent of the Delgado Mills, Wilmington, N. C.

T. B. Blackwell has received the promotion to overseer of carding at the Arcade Cotton Mills, Rock Hill, S. C.

Frank Williams, who has been overseer of the spinning room at the Golden Belt Mfg. Co., Durham, N. C., for the past five years, died at his home in Durham on January 6th.

J. F. Bridges has been made head loom fixer at the Clyde Mills No. 1, Newton, N. C.

E. A. Byrum has been appointed general manager in charge of operations of the Byrum Hosiery Mills, High Point, N. C. These mills were organized a short time ago.

H. H. Ellington, formerly of Knoxville, Tenn., has been made night overseer of weaving at the Enterprise Cotton Mills, Enterprise, Ala.

Charles H. Davis, of Knoxville, Tenn., recently accepted the position of office manager of the Rock Hill Printing & Finishing Co., Rock Hill, S. C.

J. L. Rhinehardt has resigned as general overseer of spinning at the Loray division of the Manville-Jenckes Company, Gastonia, N. C., to become superintendent of the Phenix Mills Company, Kings Mountain, N. C.

Thomas Clendinning recently accepted a position as representative of the Jacques Wolf & Co., with headquarters at Chattanooga, Tenn.

E. L. Stilson has been appointed district manager of the Birmingham office of the Bristol Co., manufacturing Bristol recording instruments. He will succeed **H. E. Beane,** who has been appointed district manager of this company, covering their branch offices at Pittsburgh, Pa., and Akron, Ohio.

Vance McKinney was recently made superintendent of the Asheville (N. C.) Knitting Mills, Inc.

Roy Riggs is now superintendent of plant No. 10 of the Cannon Mills, Concord, N. C.

The

BARBER-COLMAN

SPOOLING AND WARPING SYSTEM

»

is the Most Economical

»

Saves the Most Labor

»

Makes the Best Warps

»

Shows the Greatest Return
on the Investment

»

of Any System on
the Market

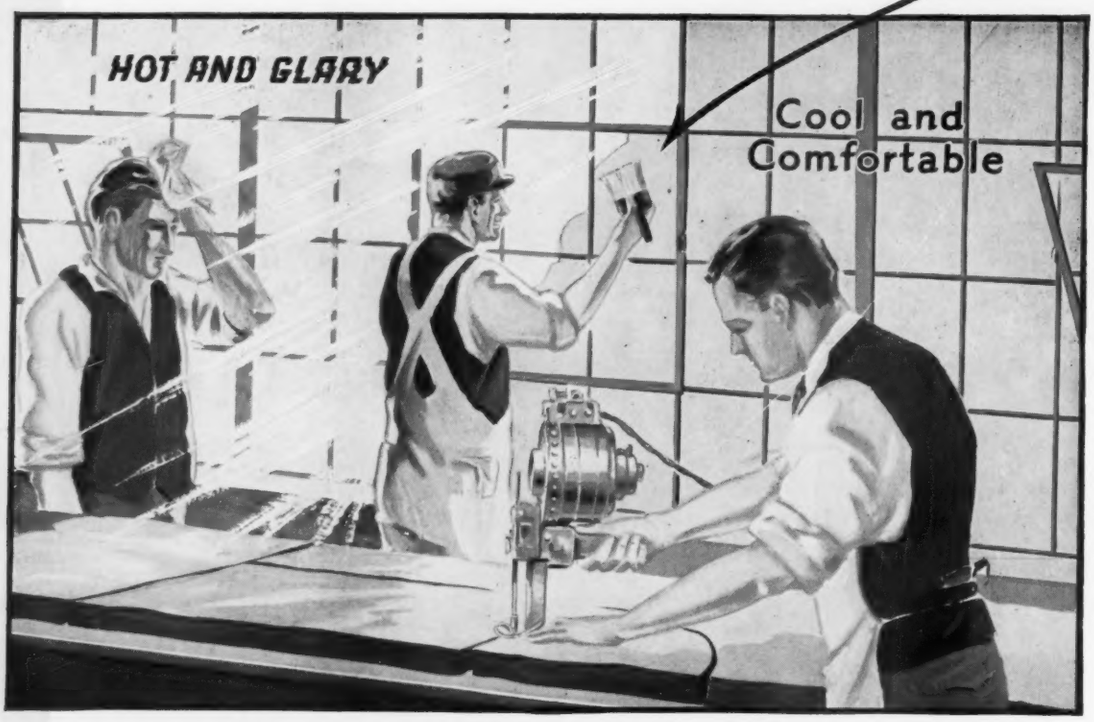
»

BARBER-COLMAN COMPANY

General Offices and Plant, ROCKFORD, ILL., U.S.A.

Framingham, Mass. Greenville, S. C.

Merely Coating Your glass with "*No-Glare*"



1. Banishes Glare and Reduces Heat 10° to 15° while Admitting 94% of Light . . . . . .

SKYCO No-Glare is a sky-blue liquid that you paint or spray on the glass of your windows and skylights. The resulting film of **No-Glare** FILTERS the intense glaring sunlight, letting in 94% of the light but rejecting *all* of the tiring glare and 15° of the heat (actual thermometer tests). Goes on *outside of glass*—yet rain or weather conditions do not affect **SKYCO No-Glare.** Neither will it rub or flake off. Yet you can remove it easily with warm water and a brush. *Just as effective if applied on inside of glass.*

2. Saves you the Cost of Expensive Shade Equipment . . . . . .

Modern mechanical window shade equipment costs a lot of money these days—both for installation and upkeep (repairs and replacements). All this heavy expense can be avoided by simply coating your glass with **SKYCO No-Glare.** It saves its slight cost many times over in one season.

A single gallon ($3.50) covers from 700 to 800 square feet of glass. **One application lasts throughout sun-glare season. Absolutely guaranteed. Used by textile mills everywhere. Sold by mill supply houses.**

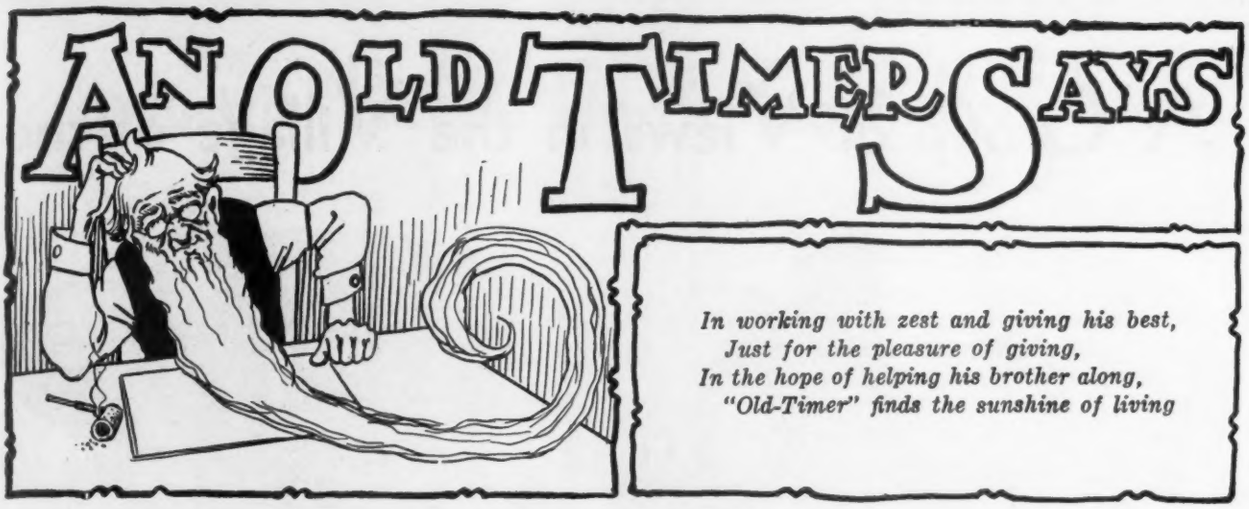
Use our convenient trial offer . . . .
Order a gallon today at $3.50 and try it on a "glary" window.

THE SKYBRYTE COMPANY, 1919 E. 19th St., Cleveland, O.

Reduces Heat 10° to 15°— Yet 94% of Light Maintained

SKYCO NoGlare

Gives a Cool Diffused Light that is Restful


AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brother along,
"Old-Timer" finds the sunshine of living

WANTED

ONE OVERSEER and ONE SUPERINTENDENT AT ONCE!

OLD-TIMER will give you the address of a good mill that is looking for an overseer and another mill that is looking for a superintendent. Both of these jobs pay good salaries and, strange to say, both of these mills will frankly tell the man they hire that it is a life-time job.

Many of you will be surprised when you get the addresses of these two mills because you very likely know them and also know the names of the men who are in charge there now. The managements of both mills have assured me that if COTTON can find the two men they are looking for, they will pay them more than they are now paying the men who are on the jobs.

This is such an important proposition that I have asked my Editor to let me use the OLD-TIMER page rather than put an ad in the magazines.

Don't get skeptical, now, they are not asking for the impossible; they are not asking for any qualifications in a man but what are possible for a lot of overseers and superintendents I know can come up to—if they will.

The mills are not making anything out of the ordinary in styles of goods; that is, there is nothing complicated about running either job. They are using a good grade and staple of cotton grown in the same cotton fields where other good grades of cotton are grown.

All native help, with a village of modernly equipped houses, good churches and schools. These things are mentioned merely to let you know there is no trick about these jobs, and that they are absolutely on the square in their appeal to OLD-TIMER to find them a man.

Oh, yes! I had almost forgotten to tell you that both of these mills assure me they will not interfere with these men in any way. That is, you will be practically your own boss. You will not even be expected to ask off when you want to take a little trip. And as for regulating the wages you pay the operatives, that will be entirely up to your good judgment.

Also, the item of supplies will be entirely at your discretion, whenever you think the market and conditions are right . . . well, as I said, use your own judgment.

There are many other items that I will talk over with you when you get here, such as your expense account when you attend the textile meetings or make a business trip for the firm. You need not bother about itemizing anything; just draw from the office what you consider will be ample for the trip and return the balance some time.

The qualifications these mills have set up for the men they want are so simple that I am almost ashamed to set them down here in print. In fact, at first thought I don't believe there will be a man who reads this—let me see, shall we call it an ad? No, that will not fit, it is more of an *appeal* than anything else—I say, I believe every man who reads this appeal for the men they want will say, "By George, that fits me. Here I go to see OLD-TIMER."

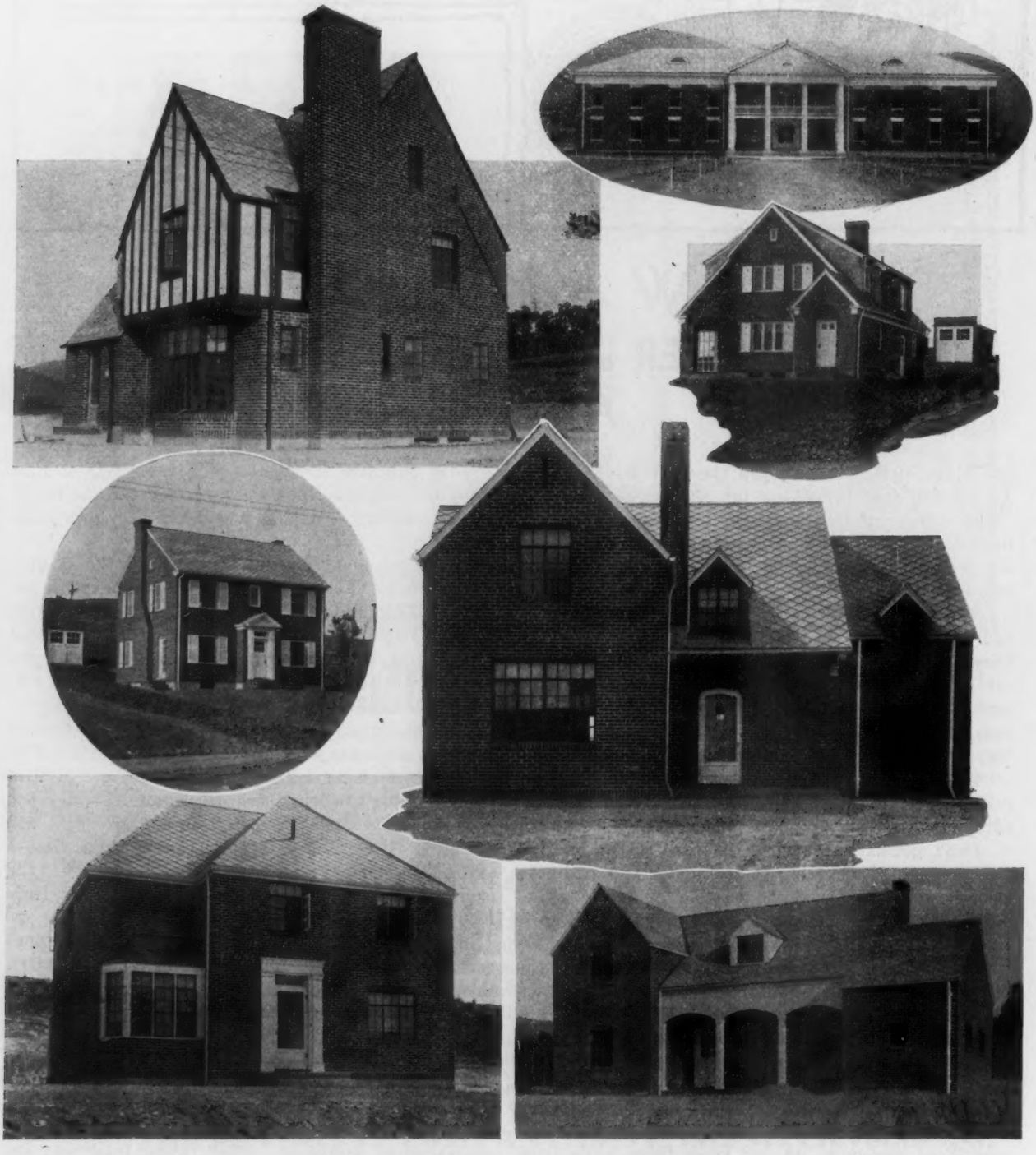
But my advice, brother, is to read the qualifications carefully; then go home and sleep over the matter, then think some more about it next day. In fact, if you ever expect to fill such a job you had better keep on thinking about it every day.

You remember an OLD-TIMER article about human nature? In that article I made the remark that human nature was one of the most complicated problems we have and yet the most simple. That sounds like a contradictory statement. Well, when I tell you the kind of man these mills want, you are very likely going to say, "Razz-berries," or "Apple sauce," or make some other slighting remark. That is why I am asking you not to be too hasty about passing judgment.

Anyway, here goes, and after reading the qualifications, if you say OLD-TIMER is a fool and that you are already *it*, just write me and I will then ask you a few questions which will prove whether you are right or not.

They want a man who will (*Continued on page* 375)

A Group of Views in the Village of the



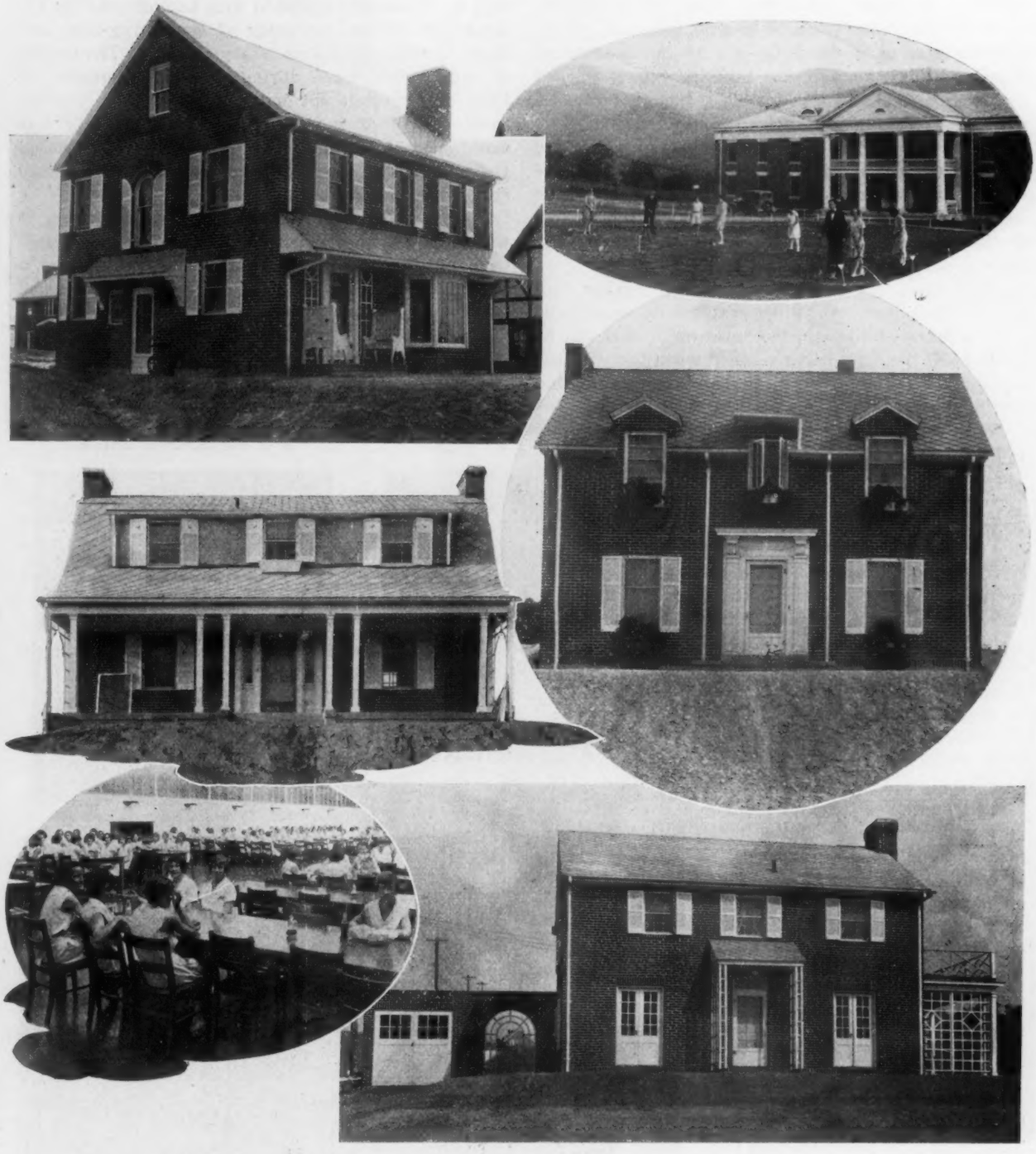
The photographs on this page and on the one following are of houses in the community erected at Covington, Virginia, by the Industrial Rayon Corporation, in conjunction with their huge rayon manufacturing plant at that place.

The individual residences shown are typical of fourteen such homes erected for plant executives.

At the top of this page is a photograph of the girls' dormitory, erected because of the problem of housing the large numbers of single girls who are employed in the rayon plants. Of this building, a recent issue of the company's Premier Rayon Review presented the following description:

"Located on level ground, high above Jackson Riv-

Industrial Rayon Corp., Covington, Va.



er, the building affords on all sides an unobstructed outlook on the lofty Alleghenies. The structure is two stories high; brick and tile construction; with high white columns in Virginia colonial style. There is a large living room on each floor. The kitchen has an electric stove and mechanical refrigeration. There is an electrically equipped laundry in the basement which the girls can use. Each bedroom contains two single beds fitted with high quality springs and mattresses."

Sixty girls live in the dormitory, and are provided with 21 meals per week, including lunches to carry to the plant from Monday to Friday. A view of the interior of the cafeteria in the dormitory, and an exterior of the building showing the putting greens, are included in the above group.

Automatically Balancing Evaporation with Air Change for Maximum Cooling.

WHEN HUMIDIFICATION was in its infancy, it was necessary to restrict ventilation in order to maintain the desired humidity. Then, to provide humane working conditions, it became necessary to revise the ideas as to standards of evaporative capacity. More and more humidifying capacity, which allowed for some ventilation, was installed, though the exact amount of ventilation secured was not known.

As the advantages of getting the cooling effect due to evaporation gained recognition, larger capacities were allowed to provide cooling and at the same time maintain the desired relative humidity in the face of the increased ventilation; and adequate capacity was advocated by leading organizations.

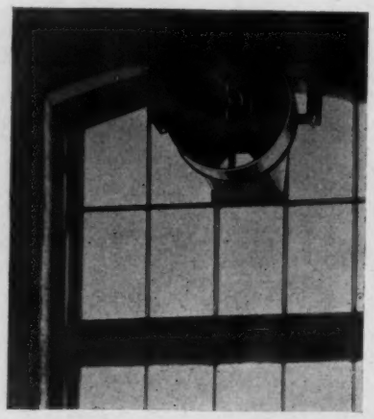
Next came the idea of balancing air change in a room with evaporation. Since evaporating water cools air, the more ventilation, the more water that can be evaporated, the limit being reached when there is just enough ventilation to keep the humidifiers running continually.

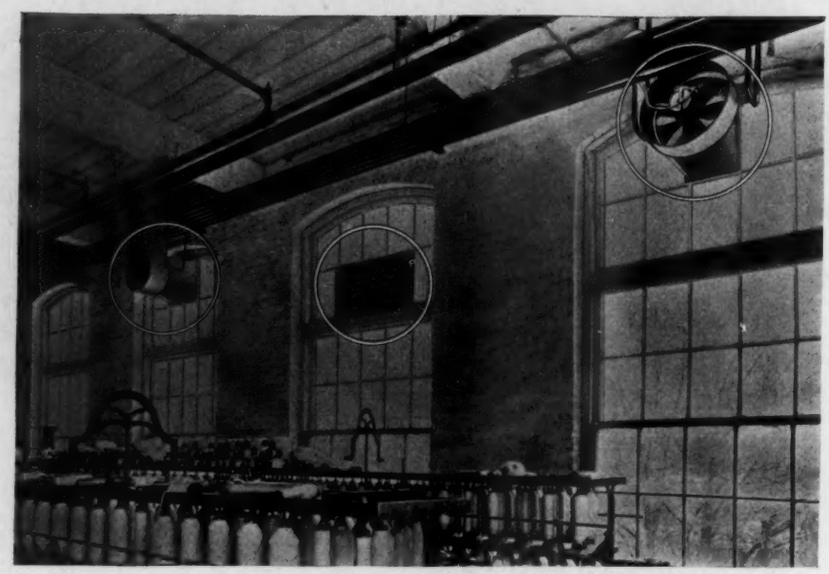
With ventilation controlled by manually opening and closing transoms according to demand, this theoretical goal was impossible of attainment. If it was desired to maintain a definite relative humidity, ventilation would be restricted so the humidifiers would operate on and off, and the humidity regulator would control the humidity. If it was desired to run the humidifiers continually for maximum cooling, it was necessary to supply an excess of ventilation, and the humidity fell off. Also, with ventilation secured by natural circulation, wind velocities and direction, as well as frequent changes in weather, created definite influences, requiring close supervision of ventilation or loss of either humidity or comfort.

It is of course impossible to control ventilation accurately by hand control, it being stated that about thirty per cent of what would be required by the theoretical balance between air change and ventilation is the amount obtained by this method. Even in these days of large evaporative capacities, mills have frequently been observed running with low humidities due to excess ventilation. By closing some transoms it has been possible not only to restore the desired humidity condition, but also to reduce room temperature several degrees.

To obtain the advantages of a positive rate of ventilation and the automatic control of it, which are available in the central station system—with a direct moisture humidifying system, by methods which could be used in a mill already equipped with a humidifying system, the Parks-Cramer Company installed in a spinning room of the Industrial Cotton Mills, at Rock Hill, S. C. (already equipped with humidifiers), an experimental system consisting of ventilating fans, exhaust louvres, and the necessary controls. The results of experiments made during the entire summer of 1930, an extremely hot one, are interesting. The reports show that the desired relative humidity was maintained at all times, working conditions improved, and atmospheric conditions throughout the room were decidedly more uniform.

To obtain the desired results, it is pointed out, it was necessary to provide the following features of control: (1) Cessation of ventilation by actuation of a limiting thermostat whenever temperature remained below the actuating setting, and, conversely (2) automatic release of ventilation for operation under the control of the humidity regulator whenever room temperature exceeded the actuating setting of the limiting thermostat. And (3) a humidity regulator which would establish and operate on (a) an upper level of





Below, a photograph showing the fans in the sash which supply air to the room, which are automatically started and stopped by humidity regulator; also showing louvres through which air is exhausted. The other side of room is similarly equipped. Above, details of fan and louvre . . . .

The diagrams below show the results of experiments at the Industrial Cotton Mills, in automatically balancing air change and evaporation. In the diagrams, the upper figures indicate dry bulb temperature, and the lower figures indicate relative humidities. The location of the figures in the diagrams indicates roughly the location of the observation points in the room.

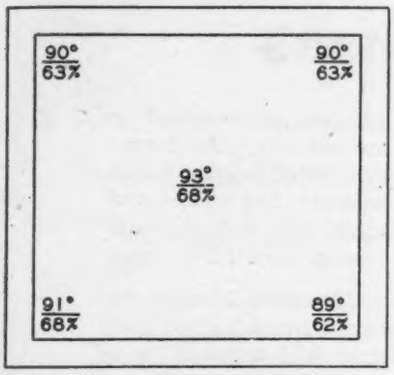


DIAGRAM I

Before the system was installed, observations were made to determine how well conditions could be controlled by adjusting the transoms. First, the transoms were adjusted to allow about 30 per cent less ventilation than would balance the evaporative capacity. This allowed the humidifiers to run about 85 per cent of the time, and was as close an adjustment as could be made without sacrificing the humidity level. Diagram I shows the results obtained. Notice the uneven conditions throughout the room.

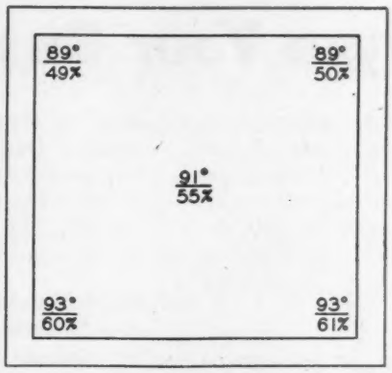


DIAGRAM II

Then the transoms were opened wider to allow about 30 per cent more ventilation than was required to balance the evaporative capacity. Now the humidifiers were running continuously but were still unable to maintain the desired 65 per cent humidity. The room was, on an average, one degree cooler, but the humidity was 10 per cent lower. It will be noticed that in this case there is even a greater variation in conditions throughout the room.

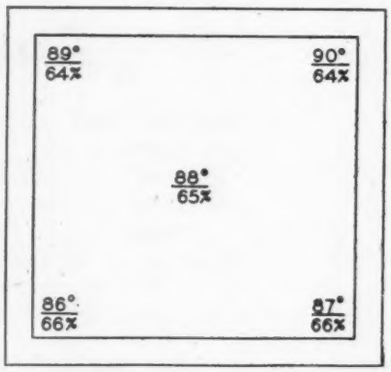


DIAGRAM III

This shows data collected after the installation of ventilation control, on a day when the outdoor temperature and humidity were exactly the same as they had been when the previous tests were made, namely 98 degrees F. and 27 per cent relative humidity. There was a two or three degree lowering of temperature over either previous condition, and at no point in the room was the relative humidity more than one per cent off from the desired 65 per cent.

relative humidity at which operation of the humidifiers was controlled; and (b) a lower level of relative humidity at which operation of the ventilating fans was controlled.

It was necessary for the regulating system to cope with several atmospheric conditions. This mill experiences cold weather in the winter, hot weather in the summer, and frequent alternations between the two conditions during the spring and fall. During cold weather, moderate and low temperature caused the limiting thermostat to "veto" ventilation, and the humidifying system was turned on and off as in ordinary practice by the humidity regulating actuating at its upper limit of relative humidity, with the ventilating system inactive. When the weather became sufficiently hot to increase room temperature above the setting of the limiting thermostat, the ventilating system went into operation and took charge of the relative humidiy. The humidity was maintained at the lower limit of the regulator, keeping the humidifying system operating continuously at full capacity, with humidity control by ventilation only. A third condition sometimes presented itself—when the room temperature hovered above and below the setting of the limiting thermostat; this condition represented the moderately warm weather of spring and fall, and illustrated the necessity of providing for automatic alternation of control of humidity by humidifiers and by ventilating fans.

Also, by supplying outside air uniformly, atmospheric conditions were more uniform, it is stated. There being no pockets of hot, dry, still air to impair production and cause discomfort in certain parts of the room.

The system consists essentially of intake fans set into the sash, to supply air to the room and exhaust louvres set in sash of windows or monitors. A "Psychrostat" regulator starts and stops the humidifiers, and starts and stops the fans, and releases control of the ventilation when the temperature falls below 75 degrees F. The slight pressure in the room created by the fans forces exhaust air out through the louvres. On the outside of the sash, a hood extends a short distance from the fan inlet to prevent rain from coming in during bad weather.

The company's two-step psychrometric regulator is supplied with this system, it is stated. This regulator, known as "Psychrostat," consists of a double slide valve actuated by the relative motion of two expansible metal diaphragms. One of these diaphragms is affected by variations in dry bulb temperature, and the other by variations in wet bulb temperature. Their relative motion, then, indicates changes in wet bulb depression, the measure of relative humidity. At Industrial Cotton Mills, a single-step type was converted to two-step operation for this application.

This system "for automatically balancing air change with ventilation, to obtain the maximum cooling from a direct moisture humidifying system without the sacrifice of desired humidity," is known as the "ParkSpray automatic airchanger," patent applications on which are held by the Parks-Cramer Company of Fitchburg, Mass., and Charlotte, N. C. The manufacturers point out that this new development does not require the scrapping of existing equipment, being supplementary, and its purpose being to enable the mill to obtain the maximum benefit from present apparatus. It is stated that provision can be made for increasing the evaporative capacity of an existing humidifying system, if desired, to provide further cooling equipment.

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

How About Doffer Comb Speeds?

Should they be lowered? Have you given the question consideration? Is this man right?

EDITOR COTTON:

In former years it was quite customary to have the doffers on cards running about 14 r.p.m. The doffer comb or comb box was always run fast enough to comb the web from the doffer at this high speed. In other words, the machine builders of almost every make of card always built the card so that the comb box would be running a great deal faster than was necessary.

Now it is a common thing to see doffer speeds down as low as 6 and sometimes 5 r.p.m. Still the comb boxes are going at the same speed as when we were running the doffer 15 r.p.m.

In taking care of comb boxes there has always been more or less trouble with them throwing oil. On our particular cards the comb pulleys go about 1,600 r.p.m. at 175 r.p.m. cylinder speed.

Why would it not be a good idea to slow them down to about 900 or 1,000 r.p.m.? I feel as though there would be less wear and tear on the wearing parts of the box and it would also be a big assistance to boxes that are throwing oil.

In other words, why run them faster than is necessary? I do not mean that the machine builders should necessarily make any change, but if a mill is willing to make the experiment, would it not be practical?

I would be glad to see any discussion on this subject from your readers. I would suggest that in answering, correspondents specify the character of work, etc., to which they refer, including the weight of laps, grain of sliver, production of card, speeds concerned, etc.

CONTRIBUTOR NO. 4943.

Wants Information on Twister Room Practice.

All you ply yarn men pitch in and give your ideas on these questions!

EDITOR COTTON:

We should like very much to see in the "HOW OTHER MEN MANAGE" department some discussion with regard to the twister room of a yarn mill, and will list below the particular items which we should like to have discussed:

We would be glad to have a full organization for a twister room making 40s/2, 50s/2, 60s/2, and 70s/2 combed peeler yarn. What is the best and cheapest method of creeling; is it better to twist from single spools or from two full tubes? Also, how shall the full spools be replaced in the twister against the empty spool?

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Is it better to creel all of the empty spools at once on the doff or to creel similar to the creeling on spinning frames?

On the numbers given, what are the best methods and regulation as to cleaning the twister, including the water-trough, thread-guide, brass rolls, etc.?

How often should the travelers be changed, and what is the approximate life of a traveler?

How many spindles can one operator run? What are the spindle and front roll speeds? How often should the rings be washed to take off all grease?

Also, we would like to have information as to the number of bands used, that is the average per week per machine. Furthermore, how often should the spindles be oiled?

For a twister room of approximately 15,000 spindles, what should be the personnel of the room, as to the supervisory positions and number of operatives?

This may seem like a large order, but we believe there are many readers who would be interested in discussions of it, and we hope that some of your correspondents will answer as many of these questions as possible.

CONTRIBUTOR NO. 4941.

What Causes Warps to Stick to Slasher Cylinders?

Any information readers—particularly weavers—will furnish as to how to stop this trouble will be welcome.

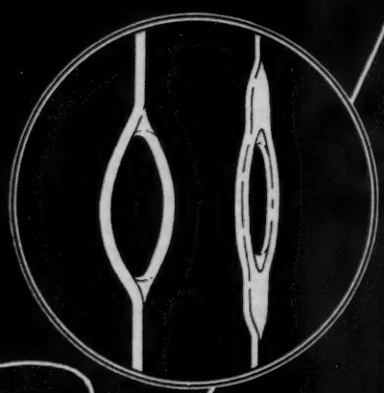
EDITOR COTTON:

I would like to submit the following question to your readers: What causes warps to stick to slasher cylinders? We are using 22s warp yarn, using as a size mixture, pure rendered beef tallow, corn starch, and gum.

I should be very glad to see an extensive discussion on this problem in the "HOW OTHER MEN MANAGE" department, giving different men's experiences as to what causes this trouble and how it may be remedied.

CONTRIBUTOR NO. 4944.

The "Eyes" Have It!



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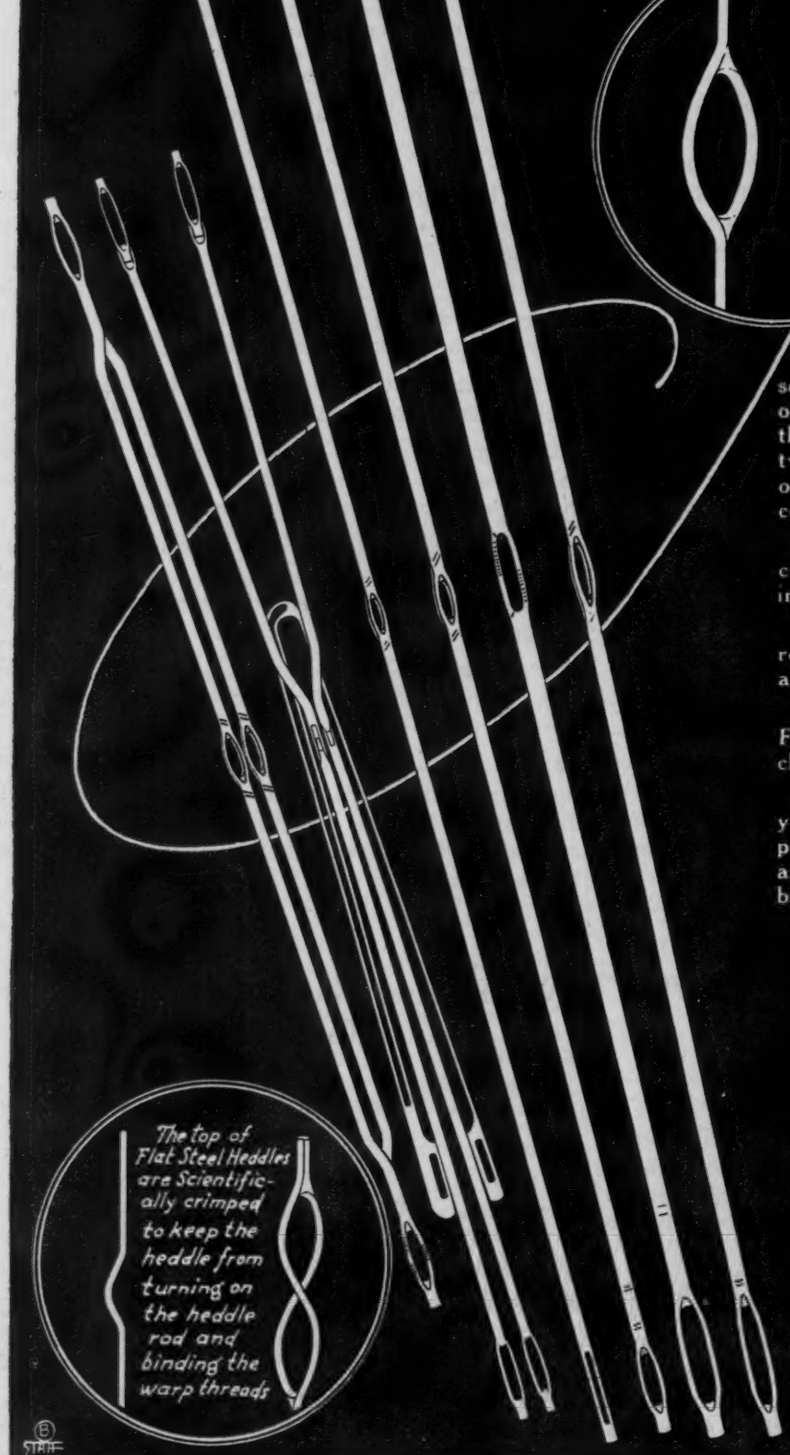

The top of Flat Steel Heddles are Scientifically crimped to keep the heddle from turning on the heddle rod and binding the warp threads

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What Do These Words Mean?

Here is an opportunity to discuss a lot of terms that are not clear to everyone.

EDITOR COTTON:

I have been wondering if I could start a worthwhile discussion in the "HOW OTHER MEN MANAGE" department of the magazine in regard to the proper meaning of a number of words and terms used in the cotton industry. I feel sure that many of us run across words and terms which have more than one meaning, or whose meaning is not clear. I think we might send in our questions and answers about these, and when the editor has printed all of them we would have a regular dictionary of such.

It is realized that the same meaning may not be given to a word in all sections of the country, for instance: While roving is "ropin" to men in some spinning rooms, in other places the word "ropin" may not be known.

As another instance, the fabric "jeans" is described by the American Society for Testing Materials as "a commercial term for a fabric with warp face twill like a drill, but with higher count and finer yarns." While doubtless this is correct for some fabrics sold as jeans, the word jeans is used to cover many other constructions. In this connection, I have at hand a piece of goods made and sold for jeans. This jeans is a 34-inch, 1.90, 54x72; 1 up 4 down, five-harness filling face twill with 13s warp and 9s filling. And another jeans made and sold by the same mill is 38-inch, 2.90, 96x64; 2 up and 1 down, 3-harness warp face drill with 28s warp and 20s filling. There are others of the twill family here that are sold as jeans, but the two examples given show how the meaning of the word "jeans" is construed.

Then there are bedford cords and piques. Our design books say that piques are fabrics with ridges running across the cloth and that bedford cords are fabrics with ridges running lengthwise of the cloth. All right, we make such bedford cords and piques, but when I admire a pretty dress my wife is wearing and call it a bedford cord because I see that the cords run lengthwise of the cloth, I am told that I can guess again, since the dress is not made of bedford cord but of pique. Now I know better than to start an argument with a woman, so I say it is pretty pique. But just what is the difference between a pique and a bedford cord?

And what do you call slub filling? The "slub" filling that I have at hand has alternate thick and thin places, and the thick places, which have about five times the diameter of the thin places, have very little twist, while the thin places have normal twist. This filling is sometimes called "ocean wave" filling.

I was asked the other day, "What is a confined fabric?" Well, what is it? I hope someone can give a better answer than I did.

And what is nub filling? and ratine filling? and repp?

There are others that have come up on occasions, but if you will answer these I will be satisfied for the time being.

J. W. C. (TENN.)

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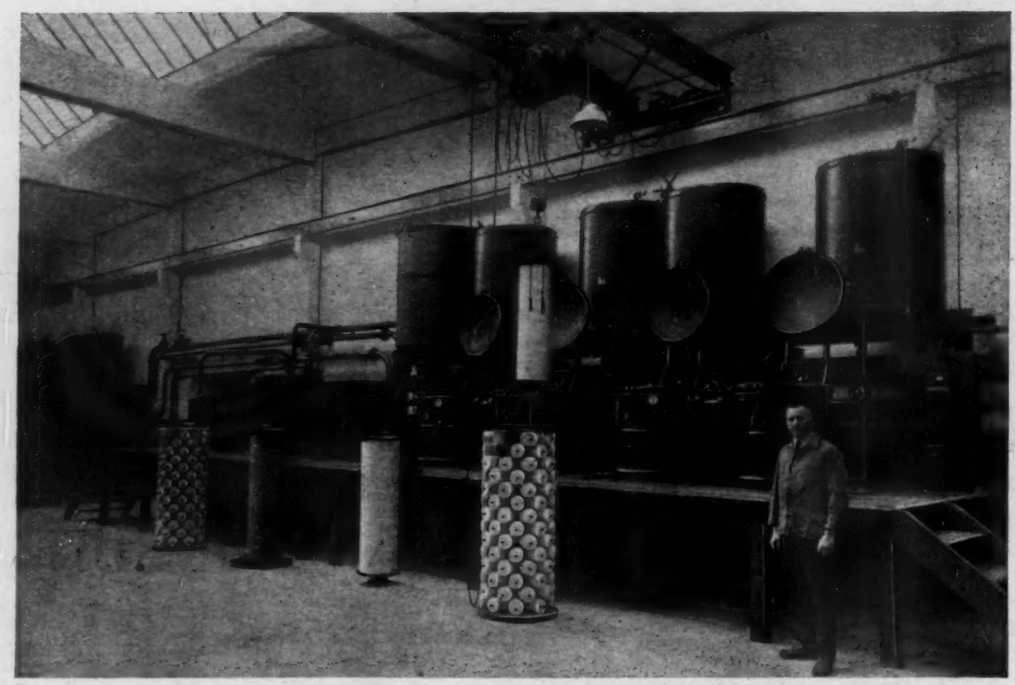

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The Cause of Difference in Warper and Spinning Production Reports.

This writer shows why spinning production reports generally are larger than the warper reports.

EDITOR COTTON:

This is in answer to the inquiry you recently submitted me as to the trouble "CONTRIBUTOR No. 4932" was having in encountering a difference in his warper production and spinning production. He said:

"We were spinning 46s warp yarn from 1 3/16-inch cotton, using 10.00-hank roving, 48-tooth twist gear, 58-tooth draft gear, and getting a front roll speed of 107 r.p.m. The twist was 4 times the square root of the number.

"Then we changed to 46s crepe twist, using the same cotton, same hank roving, 25-tooth twist gear, 49-tooth draft gear, twist factor of 8.00, and getting a front roll speed of 57 r.p.m. This yarn was conditioned on the spinning bobbins, but was allowed to stand in the spinning room before winding. No weighting materials were used in the conditioning.

"Over a period of time, the spinning showed a production of about 176,000 pounds while the warpers showed a production of only 142,000 pounds. We are at a loss to account for the difference in pounds off of the spinning and warping, and the great change in draft gears, though making the same number of yarn.

"The spinning production was obtained by dividing the total hanks by the average sizing for the week, sizings being made twice daily. Each beam from the warper was weighed directly upon being doffed.

Where "CONTRIBUTOR No. 4932" made his error was in figuring the production of his spinning frames. He divided the total hanks produced (as read from the hank clocks) by the yarn number *as sized from the bobbins*, without taking into account the fact that there is an appreciable shrinkage in the yarn between the front roll and the bobbin. The number of hanks delivered by the front roll represents the number of yards delivered divided by 840. If there were no shrinkage due to the twist in the yarn the yarn number as sized from the bobbin would be practically the same as delivered by the front roll and could be found as follows:

$$\frac{\text{H.R.} \times \text{draft}}{2} = \text{yarn number.}$$

However, when a hard twisted yarn, such as crepe twist, is being spun, the yarn number as sized from the bobbin will be appreciably heavier, due to the shrinkage of the yarn in twisting. In this case, if the same roving and draft gear were used in changing from 46s warp twist to 46s crepe twist, the yarn as sized from the bobbins would be about 37s. Therefore, in order to bring the actual yarn number back to 46s, it is necessary to *increase* the draft to a point sufficient to allow for the shrinkage in twisting.

The 176,000 pounds production of the spinning room was obtained by dividing the total hanks produced by the yarn number as sized from the bobbins, or 46s. Therefore, 176,000 × 46 = 8,128,000 hanks, which were registered on the spinning frame clocks.

For all practical purposes, the production on the

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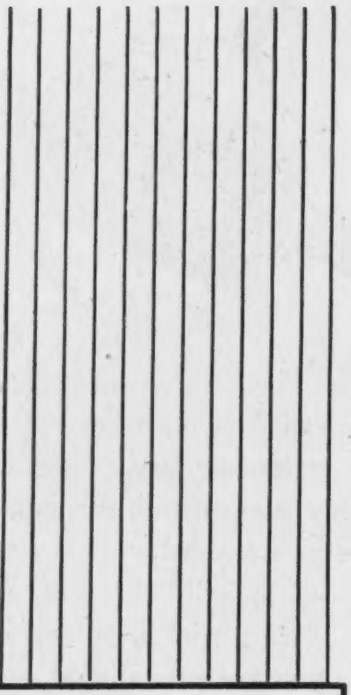

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warpers will be the same as the production of the spinning frames, because the waste between the two processes is very small. The production of the warpers was actually 142,700 pounds. Then the production of the spinning frames must have been practically the same. Therefore, $\frac{8,128,000}{142,700} = 57s$ = the yarn number which was delivered from the front rolls of the spinning frames. The shrinkage was $\frac{57 - 46}{57} =$ 19.3 per cent.

In figuring the production of the spinning frames, "CONTRIBUTOR NO. 4932" should have divided the hanks produced by the yarn number as delivered by the front roll, or

$$\frac{8,128,000}{57} = 142,700 \text{ pounds.}$$

Many mill men often wonder why the production reports of their spinning frames are always higher than those of their warpers for the same period of time. The answer is that they do not allow for the shrinkage of the yarn in twisting. In regular warp twist, this loss in shrinkage is not so great as is shown in the present case, but there is enough difference to cause them to wonder.

CONTRIBUTOR NO. 4933.

Answers to Questions on Slashing.

Here are given some very interesting answers to questions on slashing which recently appeared in the magazine. This man tells how to prevent lumpy size.

EDITOR COTTON:

I read a very interesting article in the September issue of COTTON by "T. A. D. (GA.)". He said that in an effort to get some discussion started on the subject he was going to give his methods of slashing. He said he was going to give us something to shoot at, so I think I'll take a shot.

He started his mixing by mixing the starch and softener (I shall refer to softener as compound) in the cooking kettles. He stated that he drew his water and allowed it to become lukewarm, and then put his softener in. I think that is wrong. I think the best way of mixing cooking kettles is to first draw the water and put the starch in the cool water and allow this mixture to be agitated just as long as time will permit. The automatic control should then be turned on and the solution allowed to reach a temperature of 160 degrees. Now is the time for the compound to be put in.

By putting the starch in cool water and it being allowed to agitate for awhile, much lumping and balling up of the starch is eliminated, for putting it in warm water is certain to cause lumpy size.

I have found it much better to wait until the size kettle reaches about 160 degrees to put in my compound. This gives much better results both in melting and mixing.

We draw out water in our cooking kettle and allow it to stir for awhile, then start our automatic control. We allow a temperature of 160 degrees to be reached

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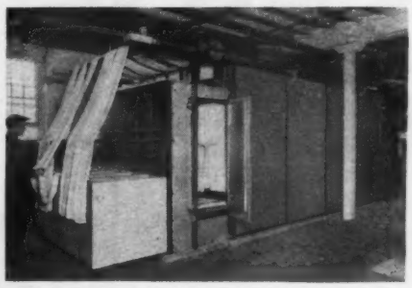

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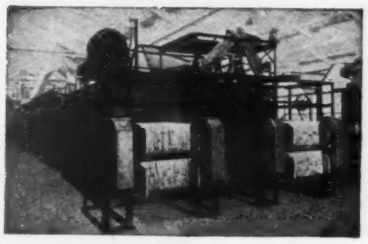

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Air drying at moderate temperatures improves the quality and feel of the yarn, leaving it in perfect condition for subsequent operations. If moisture regain is desired, "Hurricane" Cooling and Conditioning units can be operated either in conjunction with the Dryer or as separate units.

"HURRICANE" VACUUM EXTRACTOR
Saves labor, eliminates wrinkles and creases

As the goods pass over the "Hurricane" Vacuum Extractor in full *open* width, moisture is removed thoroughly and uniformly by a powerful suction. No wrinkles or creases are formed. The degree of vacuum and the speed of travel can be varied to accommodate a wide variety of goods, and to permit operation "in range" with other equipment.

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and then put in our compound. We let this cook for one hour and forty-five minutes; that is, from the time we start our automatic control. We have found this to be a very satisfactory method of cooking size.

In answer to the question by "T. A. D." as to what speed 30s yarn should be slashed, I will say that I believe 35 yards per minute is a good speed for this class of goods.

"T. A. D." wanted to know how often leases should be run when running warper beams on slashers. I would say that they should be run as often as is necessary to keep the yarn in good lease.

I have also found it good practice to keep the yarn beam bolts good and tight. This will eliminate a lot of trouble.

CONTRIBUTOR No. 4937.

Preparing Raw Stock for Dyeing.

Any other readers who wish to discuss this subject are invited to do so.

EDITOR COTTON:

We noted in COTTON the question of "CONTRIBUTOR No. 4914" who asked for the best method of preparing cotton for dyeing in a Chattanooga vacuum raw stock machine, especially when dyeing sulphur colors. He wanted to know whether or not it is better to use soda ash for boiling-off and wetting-out the cotton preparatory to dyeing, or whether some of the prepared soaps should be used for this purpose. He also asks, in case soda ash is recommended for boiling-off, whether it would be considered a good investment to use a soap or textile oil in connection with the dyeing process in order to get more level dyeing.

In reply, we would say that successful wetting-out and dyeing in this type of vacuum machine depends largely on the time and temperature elements. Naturally, more time must be given to this type of wet-out than that of the open machine. Temperature plays a great part, as cotton will wet-out quicker in a bath at 200 degrees F., than it will at 180 degrees or lower.

Soda ash is used by the greater number of dyers and dye houses; however, its general use is that of a water softener, and not as a wet-out agent. Soda ash, by softening the water, gives quicker penetration than wetting, and by this means might be called a wet-out agent; however, we have never heard of its being recommended as a wet-out agent. Where the water supply is naturally soft, we do not think that the difference in time, with and without soda ash would be material at all.

In dyeing sulphur colors, where the standing bath method is used, no wet-out agent is necessary, as the bath is always hot when it returns to the new batch of cotton, and the alkali contained therein will wet-out as quickly as desired. In the single bath method of dyeing, the use of a good oil might be recommended where quicker penetration was desired.

The question has often been raised as to what would give level dyeing in this type of machine. From actual experience we would say that it depended more on the selection of dyestuffs, rather than the wet-out agent; and we do not believe that you could tell the difference in batches wet-out with oil and with soda ash. CONTRIBUTOR No. 4928.

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SEE how Production RESPONDS to Constant Comparison of the *Actual* and *Expected*

See how lagging looms are straightway shown up and the trouble corrected. . . By re-setting counting units to zero, production is totalled from *start* of pay period only. Expected production is posted in card holder; actual production is registered on the Counter. Each weaver becomes his own supervisor.

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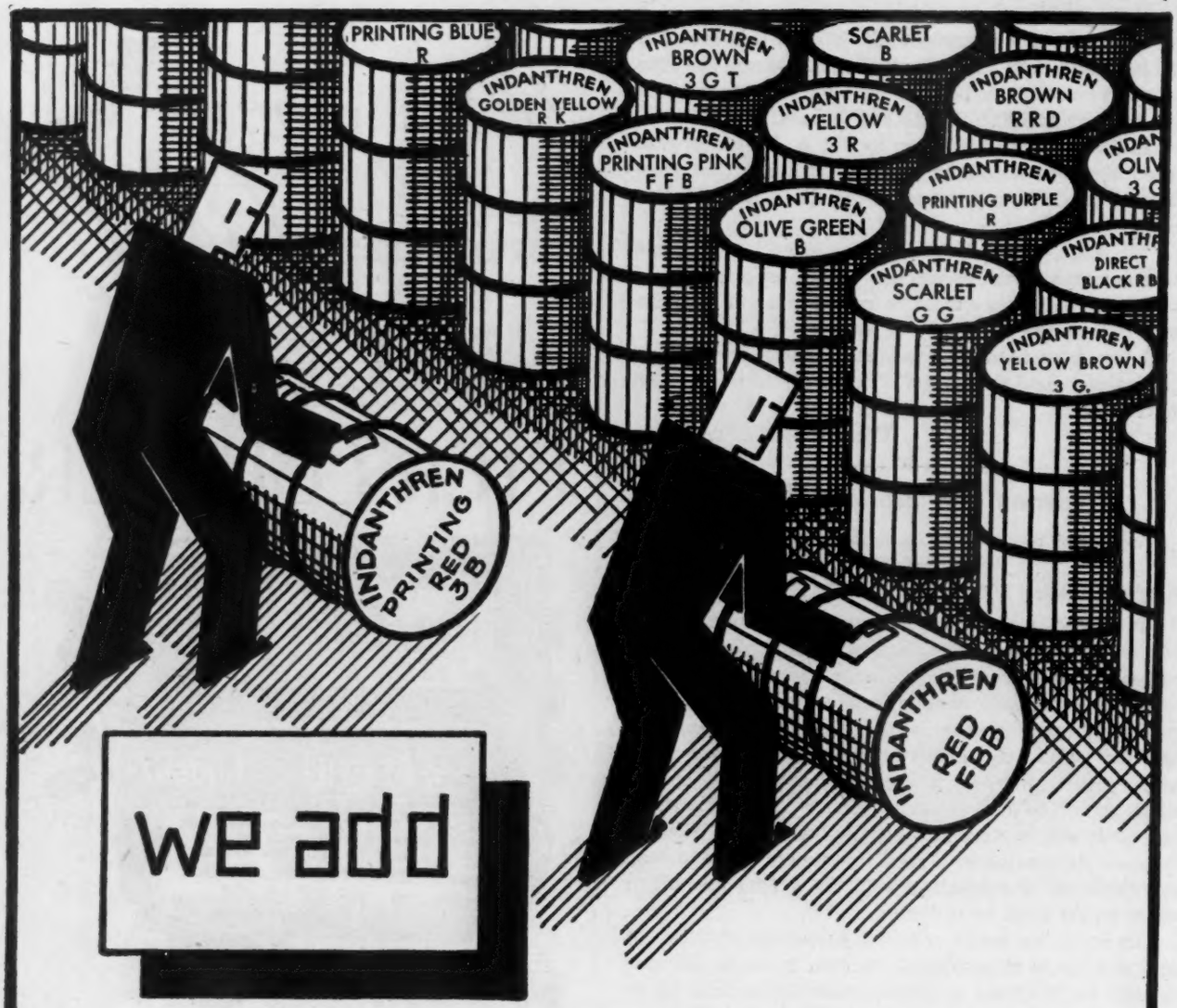
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The Attitude of the Second Hand.

Disagrees with "Contributor No. 4022" who said second hand should not "take anything for granted." What do you think?

EDITOR COTTON:

For the past year and a half, "CONTRIBUTOR NO. 4022" has been writing a series of five articles, which have appeared from time to time during this period in your "HOW OTHER MEN MANAGE" columns, on the subject of the second hand and his duties. This series has attracted my attention, and after its completion with the November, 1930, installment, I would like to express some of my views on this subject, based upon his discussion of it.

From a general viewpoint, his theory is sound and logical, but I must disagree with him in some instances. From his comments we can see that he is a broad-minded man, and an earnest writer—perhaps a superintendent with a college degree.

His statement on page 69 of the November issue seems to me to warrant a discussion. He says, "There are some second hands, and overseers too, who seem to take for granted that just because they have given an order for something to be done that they have relieved themselves of all further responsibility. When the second hand gives instructions for something to be done, he should, without fail, check up to see whether his orders have been carried out. Try it, if you are not already doing so, and see if your men do not have more respect for your orders. *Never take anything for granted.*" (The italics are mine).

Whether a man is a superintendent, overseer, second hand, section man, assistant overseer or card grinder, I think that it is a bad policy to make such an assertion. Doing this will cause and always leave the impression with your help that you think they are dishonest or not worthy of your confidence, and as a well known philosopher has stated, one of the seven fools is "the man who thinks everyone else is crooked."

Competition today is at its peak, and the loyalty of those that are working *for us*, or better still working *with us* is the greatest advantage that ever an overseer or second hand could wish for. In a letter commenting upon this series, signed by "P. R. (GA.)" and published in the September, 1929, issue, many true facts are expressed as to the minds of those who are trying to find and create the best general attitude and co-operation between superior and worker, and "CONTRIBUTOR NO. 4605" had a good discussion in this same issue.

True it is that a second hand should check up on the orders that he gives, and in doing this he should be optimistic and firm and not a contentious "bellyacher." Backing one's judgment is vitally essential, but in doing this all matters pertaining to the mill or departmental operation should be considered. It is better to be a judge than a politician while trying to hold down a position as second hand or overseer.

Just because the weather is bad, and the work is running bad, and a spinner gets stuck, there is no reason why she should be bawled out the first time it occurs, as a co-operative second hand will show a kindly spirit toward the spinner; then when an operative gets into the habit of getting stuck daily, it is time to let

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Rockweave baskets, hampers and trucks are built to take all the rough treatment you hand them. As a matter of fact, before we make any Rockweave product, we subject the material to the same severe tests that you yourself give. Then we're sure that the products will stand up under the knocks and bumps, under the strain of heavy loads and day-in, day-out service.

These baskets couldn't undergo such tests if the material weren't so carefully selected, and skillfully manufactured. To begin with, every bit of canvas is our own Triumph Duck, a strong, hard-wearing material made right here in the mills. Frames are made of round, specially tempered spring steel, and resilient galvanized strap bands riveted both crosswise and lengthwise to the frame—the most protective bottom yet devised. Top rims are bound with chrome leather. Basket shoes can be replaced when worn.

You pay no more for the better, longer service Rockweave products assure . . . If you are interested in these baskets, trucks, and hampers or in any other Rockweave product, we shall be glad to send you further information free. When you write for catalog, or send your order, address

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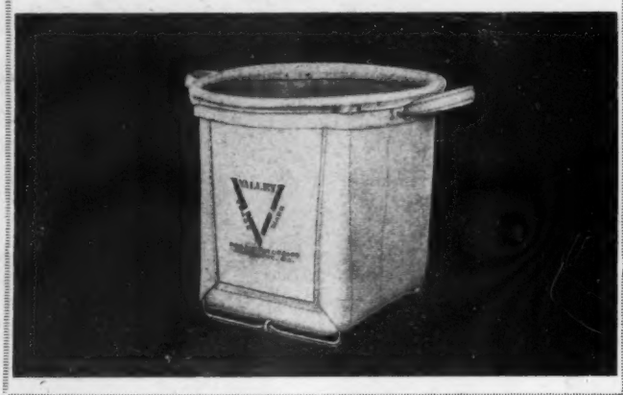

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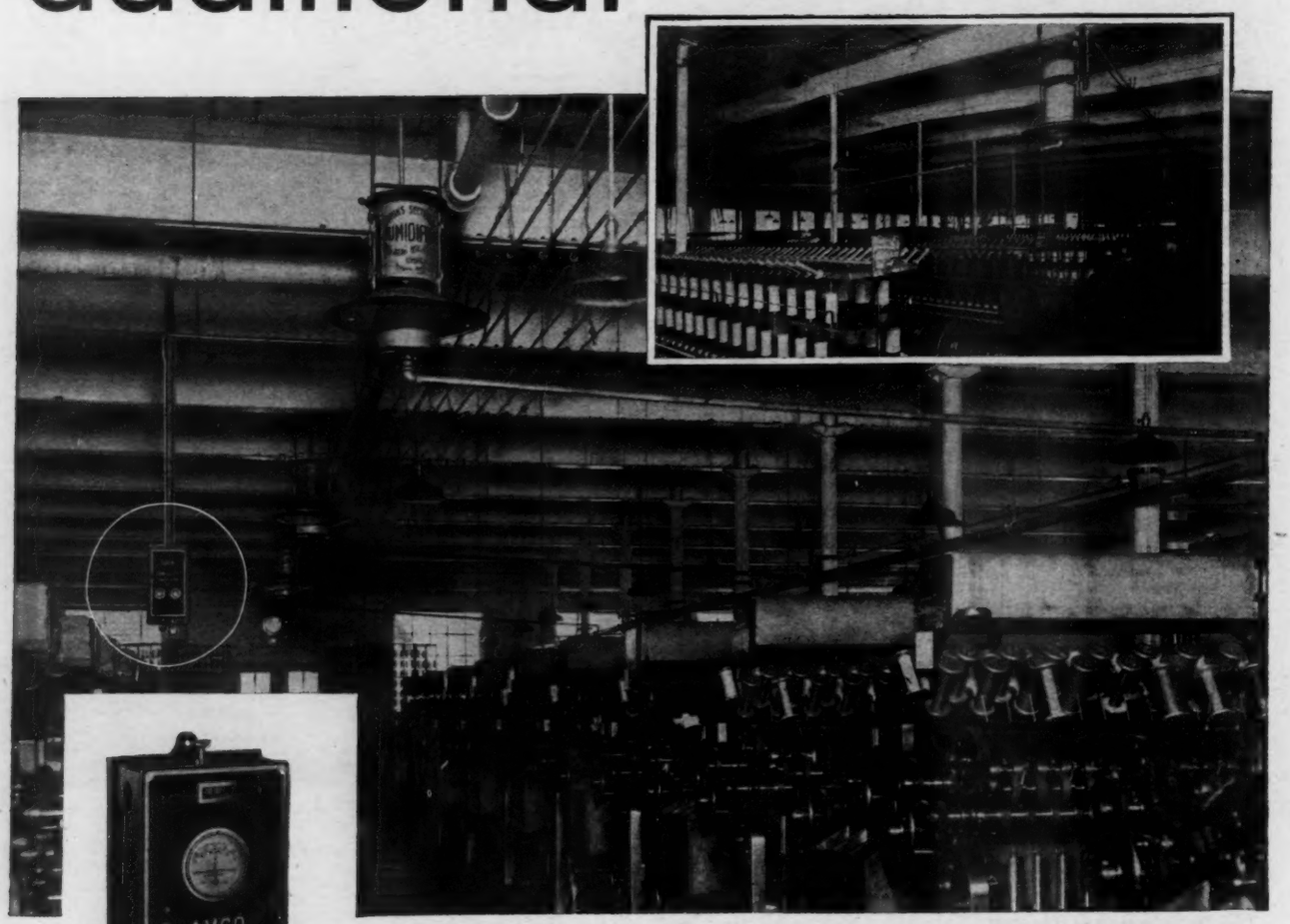

This newly designed Amco Humidity Control automatically regulates and controls humidity without using wet or dry bulb actuated devices.

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additional economy is the main objective of a mill agent today. Every mill which has installed AMCO Controls as part of their humidification equipment will tell you of the substantial monthly savings on each of several operations.

Even a saving of a few hundred dollars per month mounts up as actual cash in the bank.

AMCO savings have completely exploded the idea that human attention can cope with changing humidity. AMCO Controls are not affected by temperature,—only by moisture.

Our humidification engineers are at your service without charge or obligation to make a written survey of your humidification needs. Get an expert air doctor's advice on humidification requirements in all departments. An air doctor's diagnosis costs you nothing and may result in changing red figures into black figures, with a sweet running plant and better working conditions for labor as a bonus.

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the sand fly.

If any second hand or overseer, much less a superintendent, can or will recall the experience that he has had, he can appreciate that kind expression which someone further up the line gave him when he was working his way up and was in a tight. It sticks too, don't forget that.

Often an assistant, by being promoted, gains a respectable position, and this causes some of them to get into the habit of being quick-spoken or crabbed. This should not be so. A man should be sincere, and kind, and speak a cheery word of greeting to the help, as well as dropping a kindly word to them along during the day; he should show them that he has confidence in them. If he will do these things he will see how much better and smoother his problem will be. I prefer these things rather than mistrusting the help. They will respect a man more, and "back swords" will not be hurled at him.

I knew a second hand once who was a very nice fellow. I worked for him myself. The management wanted to apply some new ideas. A certain frame hand was agitating a strike, and his ingenuity had about succeeded, and he was about to let the blow fall. This second hand was watching developments in this connection and was taking safe steps to disrupt the faction. He and the overseer had discussed the matter and finally discharged the leader of the proposed strike, but before doing this they made sure of the right party before taking any action. This is a correct method to use, move with caution systematically. A man should not do something that he might be sorry of later; something which might be thrown back into his face at an embarrassing moment.

Another character that I knew was a young fellow who had been a bank teller and had entered the textile industry and was soon given charge of the payroll department, this being a large plant and employing upward of a thousand employees. He was another one of those seven fools, thinking that everybody but himself was crooked, and no one could please him. The overseers were paid premiums for cutting their costs of indirect labor, and of course did everything possible to make the indirect labor cost as low as possible. When an error was reported of a man being left off the payroll, this fellow would go up in the air. He would be walking through any department in the plant, see trivial things and make very deeply sarcastic criticisms and remarks, yet when the inspection committee, composed of two or more second hands or overseers, made their rounds and made their reports, listing the untidiness of his desk or office, don't think for a minute that he remained silent. It is a poor game that can't be played both ways.

The foregoing statements have been made from the standpoint of business and principle, and much more can be said about the community welfare, as concerns the heads of each department.

Whether a man is superintendent, overseer, second hand, shipping clerk, time-keeper, payroll department clerks, bookkeepers, efficiency department clerks or experts, if he is connected with a cotton mill, it is his duty to serve the people to the best of his ability in their social and community activities. He should be

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Du Pont Announces Revolutionary Development

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WHEN du Pont laboratories introduced fine filament rayon production to America, rayon making was revolutionized. Experts who look at the present use and possible future of spun rayon say that Du Pont Rayon staple may prove the equal of that fine filament development.

This new rayon staple is a special filament made by machinery especially designed for its production. It is being spun into fine count yarns.

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Du Pont Rayon staple is constant in denier, uniform in length. It dyes beautifully with ordinary viscose process rayon dyes. When spun, it has a rich underglow. It is softer, more subdued in lustre than continuous filament rayon.

Artistically, spun rayon staple is a success! One prominent dress manufacturer expects to use 100,000 yards of one of the new spun rayon cloths. Quality sport and street wear of Du Pont spun rayon will be advertised by many famous retailers for Palm Beach, spring and summer.

For information about the weaving possibilities of spun rayon staple, write or telephone to Fabric Development Service, Du Pont Rayon Company, 2 Park Avenue, New York City.

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Fine spun rayon staple yarns—plain, mixtures, specialties.

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High fancy and plain spun rayon staple yarns. Spirals, boucles, nubs.

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Novelty spun rayon staple.

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Fine spun rayon staple yarns spun on silk system—dupiouni.

PUTNAM SPINNERS, INC.,
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Rayon staple yarns spun on worsted system for upholstery.

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in their Sunday Schools, and church work, not trying to excuse himself because he might have a position that allowed him to wear a white collar. He should be willing to cooperate in everything that he is approached on, instead of being an attendant of the church and socials of the "up town" set, as some term it. If he is going to be a man of the industry during working days, he should be one at other times as well.

J. R. (GA.)

Home-Made Metal Polish for Machinery.

EDITOR COTTON:

The occasion for the writing of this article was a trip made by the Editor of COTTON through our plant, during which the Editor asked the writer how we kept our machinery in the card room looking so new. We explained that a home-made metal polish, plus some elbow grease, plus plenty of pride was the answer.

There are a great many good metal polishes on the market, and there are an even greater number of home-made polishes which have their users and believers all over the industry. In face of all of this, however, the writer ventures to set forth what he believes to be the best metal polish he has seen, for use around a cotton mill. The formula was given us by a practical mill superintendent, and it has been in constant use at our plant for several years,

The formula is as follows:

8 pounds of tripoli
2 pounds of stearine (stearic acid)
1½ pints of engine oil
4 ounces of camphor gum
1 2-3 pts. of kerosene (coal oil)

Melt the stearine by general heat. In other words, do not place it directly over the flame; but use a double boiler such as a woman uses for cooking oat-meal. Dissolve the camphor in it, then add the machine oil and kerosene. Last of all, add the tripoli and stir the mixture until it is cold.

The final mixing and cooling should be done in a bucket—about the size of an ordinary fire pail will do nicely. When it cools it hardens into something which resembles putty, but is not so soft and workable. The first bucket of it you make up should have one-half pound of powdered pumice stone for an abrasive. After the first round over the machinery, however, the pumice stone is no longer necessary.

To use it, simply take a rag and rub it on the polish. Apply to the metal surface which has previously been wiped clean of grease and dirt. It takes a bit of good hard rubbing to get a good shine. If the metal is rusty, more elbow grease will be needed than if the parts are clean.

In addition to the simplicity of making and ease in using, it has the decided advantage of being cheap. The cost of a twelve pound bucket-full is about $1.75. It is so cheap that even in these hard times we can afford to make it and use it.

We use it principally in the card room. The card hands shine one card a day on each set. It gives a beautiful satin finish to the doffer bonnets, coiler heads, and all finished metal-work. The slubber hands

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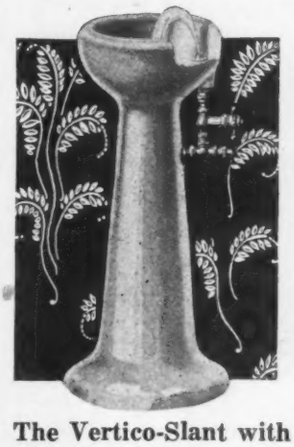
WAY PAST THE DAYS OF THE OLD TIN CUP



Many vital improvements have been made in drinking methods, but, heading the list is the R-S Vertico-Slant Sanitary Fountain.

This fountain never feels the touch of contaminated mouths and lips. It prevents them from even coming close to the jet that spouts the water.

The Vertico-Slant with the water passing angularly from jet to mouth makes each drink a safe and sanitary one. Write for bulletin.

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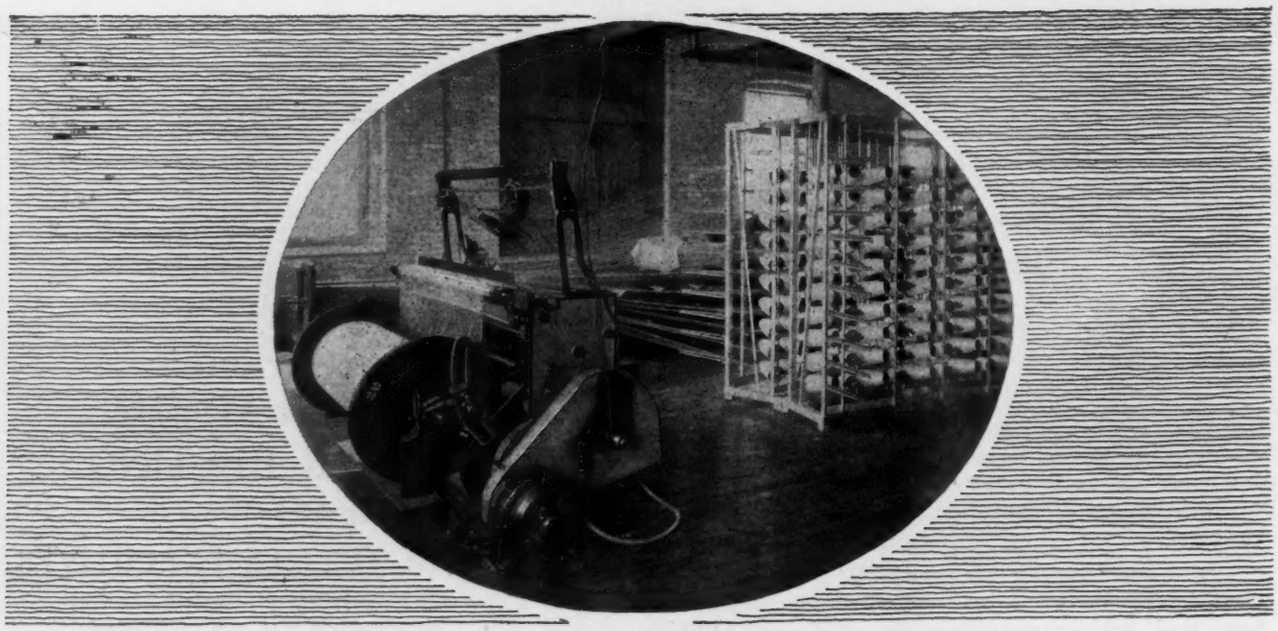

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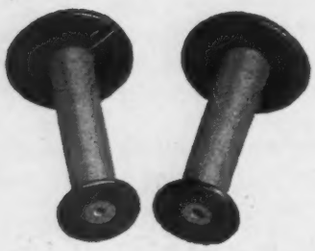
HIGH Speed Warping means fewer machines, fewer operators, greater production and a better quality of weave . . . *if it is accomplished with Lestershire Method.* In the first place, the Lestershire Method involves *less than 50% of the initial investment ordinarily required.* Furthermore, an additional saving is achieved by using your present spoolers.

The friction-free feed of the yarn as it "balloons" over the fibre spools and through the patented, rotary tension, insures a uniform quality of warp. There is no stretching or thinning of the yarn.

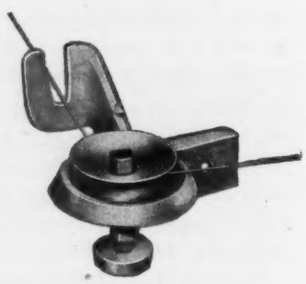
The magazine type creel permits continuous warping without stoppage for re-creeling. And all dead yarn on the spool is eliminated. In tests, the amount of waste at the slasher was cut from 9 lbs. to less than 2 lbs. per set. And it is not unusual for a set to go through the slasher without a single "lap."

There are many more advantages exclusive with the Lestershire Method. The nearest sales office solicits the opportunity of telling you in detail.

The yarn is wound on magazine-type spools. In feeding, the yarn does not drag over itself, but it balloons over.



Instead of dragging against a stationary guide, Lestershire guides the yarn through an aluminum, revolving, friction-free guide. A light, even tension is always maintained.



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The Lestershire Method of

HIGH SPEED WARPING

and speeder tenders also use it, and take great pride in keeping the unpainted metal on their frames clean and shiny. We also use it on the brass piping of our circulating size system.

It is a good all-around polish, it is easy to make and it is cheap—and what more can we ask?

CONTRIBUTOR NO. 4854.

Rambling Thoughts.

This time let's take a lesson from the setting hen, who gets no chicks if she moves too much.

EDITOR COTTON:

It has been said that the setting hen that leaves her nest too often will never hatch. It might also be said that the man who is always quitting his job and moving from one place to another never accumulates anything but debts and a bad name, and never wins promotion. Therefore, a man should not quit his job every time he gets a little mad about something and start out looking for the place where money grows on trees, for he will never find it. If there were any such places he wouldn't be able to get a job for they would be "full up" all the time.

Life is too short for a man to spend most of it running around. Besides, when he gets old, he will need the money he has spent transporting himself from one place to another to purchase food and shelter. Now don't get me wrong on this. If a man can better himself by leaving his job for another, I would be one of the first to advise him to do so, but he should be sure that he is doing this before making his decision to quit. So many people fool themselves into believing that if they can make a change and earn a little more they are bettering themselves. They don't stop to take into consideration the cost of moving or the cost of living conditions in the new place into which they are contemplating moving. As a result, they will shift around from place to place for quite awhile, then finally wind up in the same place they started from.

It is often said that "cotton milling" is a poor game. It is if it is played poorly, but if it is played as it should be it is a great game, for every fellow has a chance. The poorest paid operative may, by hard work and loyalty, work up to the best paid position in the mill. If a man is full of pep and is not dead from the shoulders up it is certainly possible for him to get ahead in the mill game.

There are too many fellows who are ready to quit when they make a few mistakes. They are ready to brand themselves failures and let it go at that. The best sign of successful work is work that is interspersed with a few mistakes. That shows real aggressiveness. The man who never makes a mistake may be classed a 100 per cent failure, for it indicates that he never tries anything very difficult. So we should all reconcile ourselves to the fact that we must make some mistakes, but let us make just as few as possible and strive to never make the same one twice. Then we will be profiting by our mistakes.

I once worked for a man who, when I told him of a shortage in my pay envelope, made the statement that he never made mistakes. Instead of showing me

THE TRUTH SEARCHER

Socrates was the original searcher for truth by the question and answer method. His spirit and teachings still vigorously survive because of the value of his ideas.

Progress has been made since Socrates died in 399 B. C., yet today the best way to discover the truth of a problem is to ask questions about it.

So a number of users of Type-K Quill Cleaners were asked questions about the results they are obtaining. Their answers offer an excellent guide as to the possibilities which the Type-K Quill Cleaner has for you.

For example, one of the answers of Riverside and Dan River Cotton Mills, of Danville, Va., was that with Type-K machines cleaning cost was reduced from 12 cents per thousand to 6½ cents, which on 900,000 bobbins per day amounts to an annual saving of approximately $13,612.00.

The complete answers of The Riverside and Dan River Mills and other Type-K users have been collected in a "Fact" book which is yours for the asking. Just ask for "Type-K Facts" and get the whole interesting truth about this cost-cutting machine.

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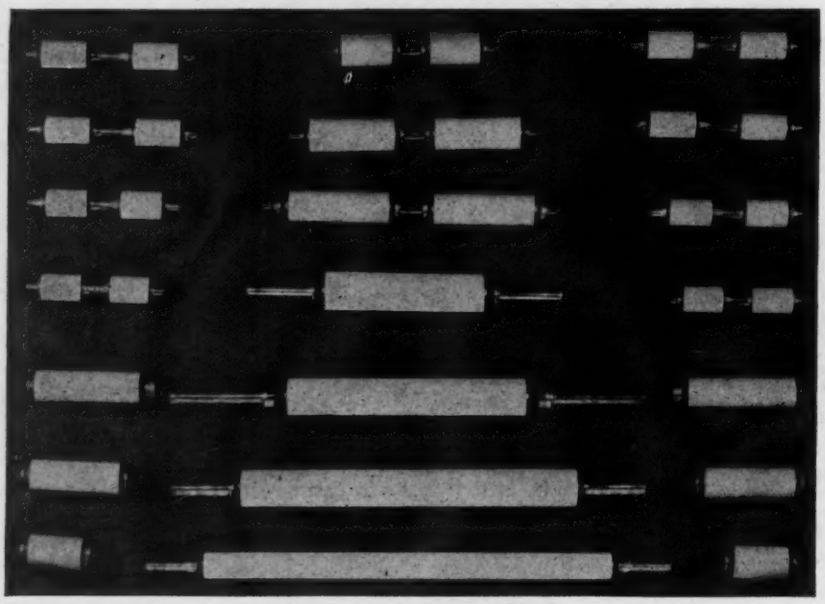

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the courtesy of having the office check up to see if I really had been short-changed, he became enraged and made that statement. I went to the office myself, and after a little investigation they found that I was due more money. That ended my stay at that mill, for I would not work for any man that never makes mistakes. That overseer is today, instead of being an overseer, running fly frames. That is where he should be, too, for any man that cannot show his fellow man a little courtesy certainly should not have charge of men.

J. T. D. (MISS.)

Card Settings.

EDITOR COTTON:

I see where "CONTRIBUTOR No. 4713" in the May issue says that he thinks I had some good points in my article, "Some Points on Card Grinding," which appeared on page 415 of the February, 1930, issue of COTTON, but that he disagrees with some of them. That is no more than I expected, for, as I should have stated, no two men will agree on the same setting of a card.

He says he does not like backing off the doffer to a full gauge when starting the card to grinding. He says, "By backing off the doffer, the chances are more doffers and cylinders will be faced on account of someone forgetting the jam-nut is backed off in the opposite direction from the cylinder." If we have a man grinding that will back off his doffer and then forget to tighten up the jam-nuts, then that man is not capable of looking after anyone's cards. Another man should have his job. When a man has advanced far enough to become a card grinder, he should certainly know enough to tighten up the jam-nuts when he loosens them.

"CONTRIBUTOR No. 4713" also disagrees with my setting to a No. 10 gauge for the doffer comb. All that I can say is that I have tried most all settings on this comb and I have found a No. 10 gauge to give the best results. We all know that the web will run tight at times and again it will bag, but we can remedy this by raising and lowering the comb, and then resetting it, but I believe a No. 10 gauge is the proper gauge for this setting.

He also disagreed with my statement where I said I seldom removed my stripping plate after the card is set up. I don't want him to get me wrong here, for sometimes there are lumps of cotton that go through the card and knock the plate out. It should then be set to a No. 17 gauge at top and a No. 22 gauge at the bottom. However, I cannot see why this plate should be set at all under ordinary conditions. It's true that it is possible to find some that the clothing of the cylinder has been rubbing, but why? Because that card has been faced at sometime or another and had the wire on the cylinder raised. When the wire is scraped back in position, the plate will be O. K., though.

If we back our doffer off when grinding we eliminate any chance here of facing the card. However, I do not expect everyone to agree with me. It is these differences of opinions expressed by the different readers that has made your "HOW OTHER MEN MANAGE" department what it is today.

C. R. D. (N. C.)

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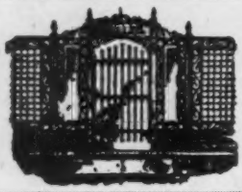

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METALLIC DRAWING ROLLS
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BESSEMER CITY, N. C.

Dyers, Bleachers and Finishers Hold Successful Meeting in Charlotte

(*Continued from page* 332.)

the Southern Textile Association, followed with the response. In his splendid talk he pointed out that the textile industry was a sick industry—that it needed an operation—and that an operation is just what it is going to get, and that he felt confident that the operation which is in process at the present time is going to put Old Man Textiles in a healthier state than he has ever known.

Secretary Taylor next introduced the honored guests. This was followed by several entertainment features which had been arranged by Arthur Thompson and W. H. Willard. Judging from the ability of the entertainers to win applause from the crowd, it would not be idle talk to say that Messrs. Thompson and Willard certainly know their entertainers. The entertainment included several very popular song numbers, along with equally popular dance numbers.

Sam L. Hayes, chairman of the Piedmont Section, American Association of Textile Colorists and Chemists, gave a very interesting talk along the lines of education, the encouraging, and the training of skilled workmen. He said, "We are passing through an era of world-wide depression in which this particular industry has had its share of lowered production and lowered prices. But that we are on our way out, seems to be the general opinion of most industrial leaders and bankers. In coming out of it we are going to have new conditions to meet, and new standards to maintain. Out of these periods of depression comes new efficiency, and the present day task of every executive is to bring his plant to the point where it can participate profitably in the business which is coming. There has never been a time in the history of the textile industry when competition was as keen as it is today. It is not that the fit survive; it is the survival of the fittest."

Mr. Hayes gave many helpful slants on the ability of the southern laborer to learn, the advisability of listening, advising, and vesting in the operative a spirit of job pride and morale. He stated that in emerging from the difficult period of the present leaders will be needed who will accept responsibilities, and that they will be picked from the men who can acquire the habit of true fact finding and are willing to accept more than their share of responsibility.

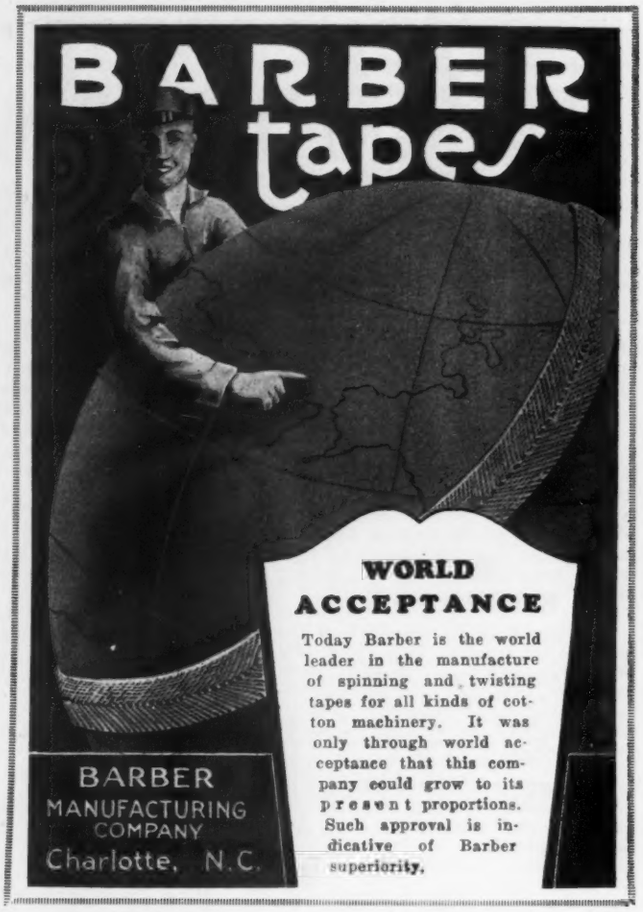
David Ovens, general manager of Iveys Department Store, Charlotte, next gave a talk on "Putting Prosperity in Piece Goods." He told of the part that style plays in selling, of the value of imagination, and of the importance of individual initiative.

The very successful meeting was concluded by a humorous talk by Dr. A. C. Chappell, of Monroe, N. C.

An Old-Timer Says

(*Continued from page* 349.)

Run the job like it belonged to him!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Today Barber is the world leader in the manufacture of spinning and twisting tapes for all kinds of cotton machinery. It was only through world acceptance that this company could grow to its present proportions. Such approval is indicative of Barber superiority.
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The booklets or catalogs briefly mentioned below may be obtained by any reader of COTTON who will write to the Company issuing them or to COTTON, Grant Bldg., Atlanta, Ga.

1. Cotton Picking, Carding and Spinning—Covered by three different catalogs. Picking catalog covers Opening and Picking Machinery; Card Room catalog covers Cards, Combers and Roving Frames; Yarn Machinery catalog covers Spinning, Twisting, Spooling, Quilling and Reeling. By Whitin Machine Works, Whitinsville, Mass.

2. Pepperell Equipment—10 page illustrated booklet, showing High Speed Warping from cones as adopted by Pepperell Manufacturing Company after thorough experiments. Installation and product photographs. Issued by Universal Winding Company, Boston, Mass.

3. Modern Practice in Textile Wet Finishing (Slack Loop System)—Practical discussions, various methods bleaching, covering batch, semi-continuous, fully continuous for cotton, rayons and mixtures. Request must be on mill letterhead. By Rodney Hunt Machine Co., Orange, Mass.

4. New Methods of Opening Cotton, also "Brown" Automatic Mixing and Cleaning Distributor—Illustrated booklets showing advantages of Centrif-Air Cotton Cleaning System. Pamphlets also on better picking and carding and pneumatic trunk line cleaner. Issued by Centrif-Air Machine Company, Atlanta, Ga.

5. The Bahnson Master Control—Bulletin No. 801, 5 pages. Illustrated. Automatic device designed to control humidifying equipment so as to maintain a constant relative humidity. By the Bahnson Company, Winston-Salem, N. C.

6. "Cotton" Weather Vein, 32 pages; "Rayon" Weather Vein, 40 pages; house publication, illustrated. Bulletin 58, 80 pages, illustrated; Manufactured Weather—the automatic control of air conditions within buildings. Carrier Engineering Corporation, Newark, N. J.

8. "Textile Brushes"—10 page booklet illustrating brushes for cleaning every part of mill. By Gastonia Brush Co., Gastonia, N. C.

9. "Custom-Built" Motors—Complete set of bulletins covering various types of electric motors for textile master mechanics and executives. By Louis Allis Company, Milwaukee, Wis.

10. Leathers, Textile—Booklet No. 101, 48 pages. Illustrated. Showing BONDARON Check Straps—Lug Straps—Harness Straps—Pickers—Belting, both round and flat, etc. Horsepower tables and other interesting information. By Charles Bond Company, 617 Arch Street, Philadelphia, Pa.

11. Whitinsville Rings—16 page illustrated booklet. Describing ring manufacture, measurements, types, uses. How to determine flange sizes. By Whitinsville Spinning Ring Co., Whitinsville, Mass.

12-A—Instruction Manual for Type K Bobbin Cleaner. Also, Instruction Manual for Utsman Bobbin Cleaner—two separate booklets describing adjustments of machines outlined and also describing effect of bobbin shapes upon the cleaning process. These booklets intended for users of machines outlined. Applicants should designate which booklet is desired. By the Terrell Machine Company, Charlotte, N. C.

12-B—Instruction Manual for the Termaco Roving Bobbin Cleaner—booklet in four sections on adjustment of machine; on how to use machine to best advantage in reducing waste and saving labor; parts catalog; description of new attachments which can be applied to earlier models of the machine. By the Terrell Machine Company, Charlotte, N. C.

13-A. Equipping Modern Textile Plants—Booklet, 35 pages, illustrated. Describes value of Monel Metal equipment in textile plants and presents reports from mill owners and operators on actual experiences; equipment, descriptions, etc. Also Dyed in the Truth—Reprints of advertisements of special interest to textile dyers. International Nickel Company, Inc., 67 Wall Street, New York, N. Y.

14. Emerson Conditioning Ovens—2 booklets on conditioning of textiles, or determination of the amount of moisture in textiles. Issued by Emerson Apparatus Co., Melrose Highlands, Mass.

17. The Powers System of Thermostatic Control—"Slasher Room is Bottle-Neck of Textile Mill." 18 page illustrated booklet showing importance of proper treatment of cloth in slasher room and advantages of Thermostat over hand control. Also room temperature control illustrations. Issued by Powers Regulator Co., 2739 Greenview Ave., Chicago, Ill.

18. Popular Industrial Chemistry—162-page handbook for dyers, chemists, finishers, purchasing agents. By Kali Manufacturing Company, Philadelphia, Pa.

19. Quaker City Chemical Co.—48-page booklet containing useful information, tables, formulae, on dyeing, bleaching and finishing all textiles. Issued by above company, 2786 North Broad St., Philadelphia, Pa.

20. Bleaching, Dyeing, Finishing and Printing Textile Goods—70-page booklet containing interesting information on faults and methods in finishing goods, useful tables and definitions. By Bosson & Lane, Atlantic, Mass.

21. Warp Sizing and Composition of Cotton—Folder containing reprints of articles carried by textile publications of interest to progressive mill superintendents. By Seydel-Wooley Co., 748 Rice St., Atlanta, Ga.

22. Tragasol and Its Uses—Booklet, 60 pages, constituents and properties—Dissolving and preparation—sizing and dressing of yarns—cloth finishing—miscellaneous. By John P. Marston Co., 247 Atlantic Ave., Boston, Mass.

23. Practice of Rayon Sizing in American Mills, Raygomm, Lakoe Gum—Three booklets on products for sizing and finishing rayon and other textiles, presented by Stein Hall & Co., Inc., 285 Madison Ave., New York, N. Y.

24. Wyandotte in the Textile Mill—90-page booklet with information on bleaching, dyeing all textiles, including hosiery.—J. B. Ford Co., Wyandotte, Mich.

25. Canvas Baskets and Trucks—Doff boxes, trucks and for all textile uses. By Rockweave Mills, LaGrange, Ga.

27. The Seven Factors of Belting Economy—Booklet, 112 pages, illustrated, containing authoritative information on the economical layout, care and operation of belt drives. Chas. A. Schieren Company, 88 Ferry Street, New York, N. Y.

28. Akron Belting—Practical rules and general information for users of belting with belting catalog. By Akron Belting Co., Akron, Ohio.

30. Lubrication of Textile Machinery—32 pages, illustrated. Data covering the economical lubrication of all textile machines. New York and New Jersey Lubricant Co., 292 Madison Ave., New York, N. Y.

32. Flooring, Open Steel, Area Gratings and Steps—Folder, 6 pages. Illustrated. For platforms, walks and stairs; non-slipping. By Kerlow Steel Flooring Company, Jersey City, N. J.

38. Sleaziness in Full Fashioned Knitting—Illustrated survey with samples of fabric showing causes of sleaziness, and methods to be employed in eliminating it.—By Textile Machine Works, Reading, Pa. (This company also issues parts catalog of Reading full fashioned machine with general information on subject of full fashioned knitting.)

39. Trend of Sales of Silk, Rayon and Cotton in the Piece Goods Departments; twenty-four-page booklet; prepared by DuPont Rayon Company in conjunction with National Retail Dry Goods Association. Copy furnished without charge by either of above. DuPont Rayon Co., 2 Park Ave., New York, N. Y.

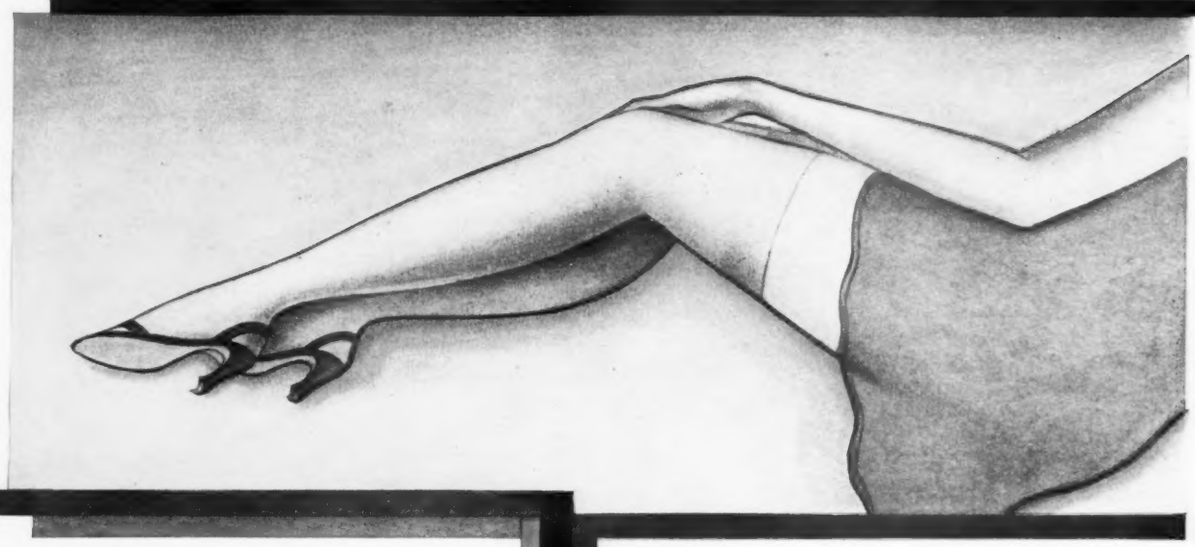
40. The New Competition in Color—20 page illustrated booklet. Discusses future trends in business and their significance, present trend toward fast colors in textile industry and opportunity this trend offers for increased profits is properly utilized. By Franklin Process Co., Providence, R. I.

41. Budget Control—40-page booklet showing how each part of business budget should be prepared and principles of its effective operation together with a summary of benefits.—by Ernst & Ernst, accountants, 27 Cedar Street, New York, N. Y. (This company also has available booklets on Standard Costs, Business Control Through Analysis, The Better Wage, Factors to Consider in Working Out Mergers.)

42—Textiles and the Telephone Typewriter—6 page booklet on telephone typewriter service for communication between mills and selling houses. By American Tel. and Tel. Co., Long Lines Department, Atlanta, Ga.

44. Points of Interest in and Around Atlanta—36 pages. Illustrated, describing places of scenic and historic interest in Atlanta in particular, and the Southeast in general. Atlanta Biltmore Hotel, West Peachtree, Fifth, Sixth & Cypress Sts., Atlanta, Ga.

Knitting Section



THE new model "K" machine knits this stocking without a seam . . . smooth of foot and fitted Gussetoe . . . with flattering shapeliness in leg and ankle. And women who understand the charm of a lovely stocking with line unbroken by seam, choose it as the perfect accessory.

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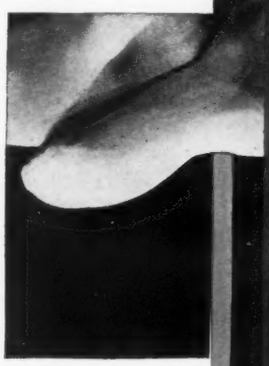

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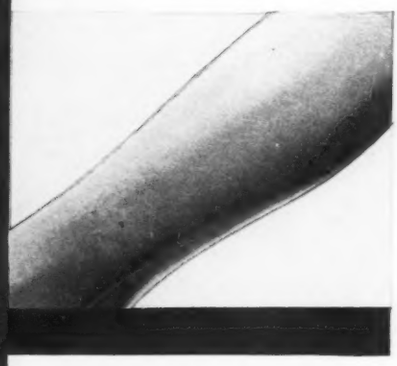
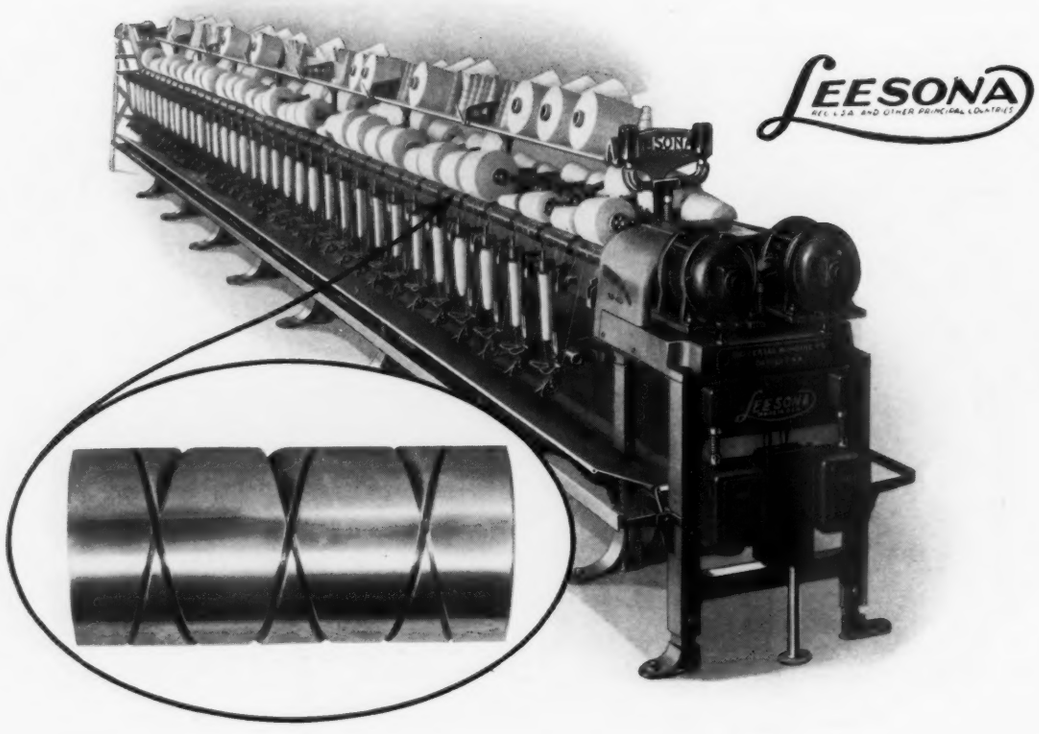


No seam to twist or mar the sheer.



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BOSTON

318

UNIVERSAL WINDERS

The Maintenance of Full-Fashioned Machines and Other Equipment

By C. H. Baxter

A COMPLETE PROGRAM is given here for the inspection, oiling, and cleaning of the equipment in a full-fashioned mill. This will interest the executive as well as the practical man.

Not only the knitting machines themselves—which are of course the "heart" of the plant—but cone winders, loopers, seamers, boarding and other equipment are discussed in this article by Mr. Baxter.

IN THE MANUFACTURING of full-fashioned hosiery, the maintenance of equipment is a very important factor, first, because of the high cost of equipping a full-fashioned hosiery plant; and second, because of the delicate mechanism of the machinery and the importance of manufacturing hosiery with the lowest percentage of seconds possible.

The knitting machines, of course, are the most expensive of all the machines needed for manufacturing full-fashioned hosiery and therefore should be given the most attention; but then one should not neglect the auxiliary equipment, such as the looping and seaming machines, cone winding machines, work boxes, tables, etc.

Maintenance of equipment is something that should be done through a system of inspection and these inspections should be made constantly in order to reduce the cost of maintenance or upkeep. For instance, take the knitting machine; how often breakdowns are caused because of lack of oil or grease and how many times seconds are made because of bad needles or sinker lines, or poor selvages. Inspection of the fabric and inspection of the machine would prevent these things from becoming chronic if they were taken care of and fixed as soon as discovered.

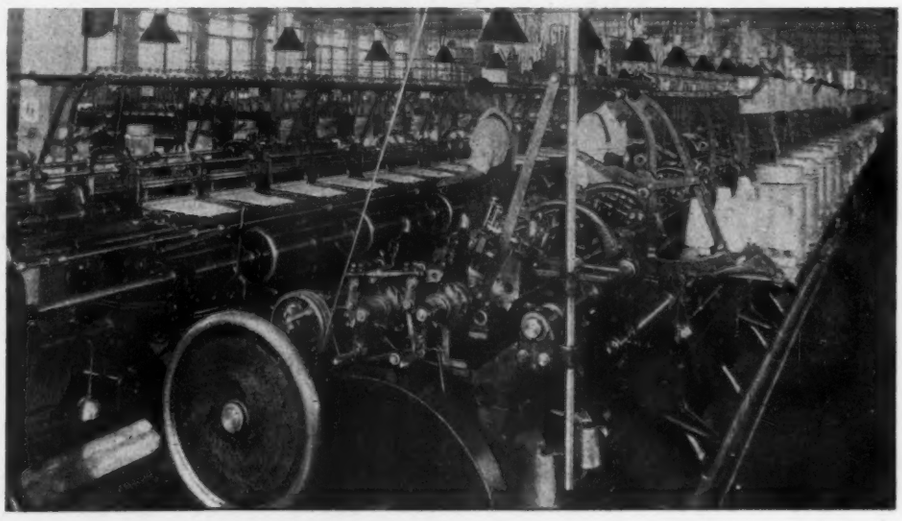
In order that I may outline my ideas as to the various things that must be looked after and taken care of in maintaining the equipment of a full-fashioned hosiery plant, let us take the cone-winding machines first, as this is the first operation in manufacturing full-fashioned hosiery.

Oiling is the most important part of maintenance of winding machines and the oiling of these machines should be done frequently. The type of cone winding machine mostly in use in hosiery plants is one that has what is called a reservoir oiling system and while the manufacturer of these machines urges the complete oiling of a machine every two months, I have found that it is better to oil at least once a month if one wants to get the best result from the machines and give them a longer life.

To obtain good winding one should inspect or examine the porcelain parts each week and replace all parts that have become nicked or are cut. Slippage of belts should be watched and the slack should be taken up immediately, otherwise a poor cone is wound, which causes trouble and waste on a knitting machine. All worn parts should be replaced as soon as seen, especially such parts as spindles and guides.

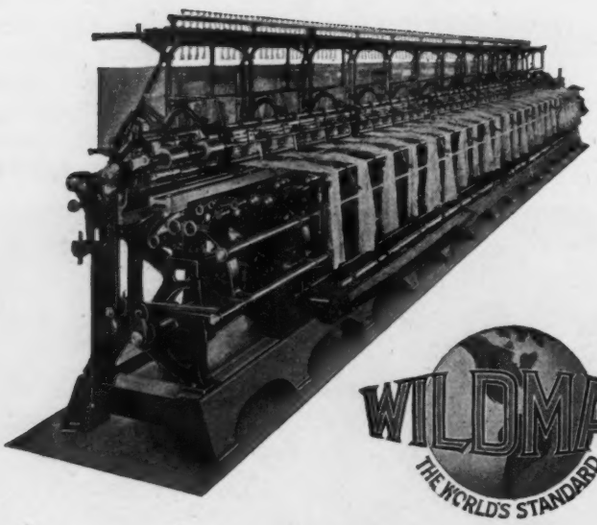
The Knitting Machine.

The knitting of hosiery is the next operation and as stated before the knitting machines are the machines that should be given the most attention. In operating a knitting machine the first and most important thing that must be done and done systematically is the matter of oiling the machine and the use of proper oils for certain parts of the machine. For the oiling of bearings, sinkers, cams, draw cam rollers, as well as all other rollers a light spindle or machine oil should be used. For the slur cock bar or slide as it



Leggers in a prominent southern knitting mill

A child learns to put the heavy blocks at the bottom



In the same way, in developing the Wildman Full Fashioned Hosiery Machine, we learned the tremendous advantage of using an extra-heavy base. It results in great freedom from vibration when the machine is operated.

This is but one of many noteworthy improvements in the new Wildman.

Write for further information.

WILDMAN MFG. CO.
Full-Fashioned Division
NORRISTOWN, PA.

WILDMAN
THE WORLD'S STANDARD

WILDMAN
FULL FASHIONED HOSIERY MACHINE

A portion of the footing department in a southern knitting mill

is sometimes called, a heavier grade of oil should be used. This grade of oil should also be used for gears and drive chains. Where grease cups are used these should be filled with a grease that is not too heavy in body and this grease should also be such that it will not dry up or cake.

No oil should be used on friction rods, as oil will cause the frictions to slip and result in broken needles and poor selvages. For friction leathers, castor oil or neatsfoot oil should be applied to the leathers and this will keep the leathers soft and pliable and prevent the leathers from glazing.

A very light oil should be used for the needles, this oil being such that it is practically stainless so that it can be easily removed when the goods are boiled off.

In the matter of oiling a knitting machine the knitter should be instructed to oil all rollers and bearings each day. He should also oil the needles whenever the machine is stopped for the lunch period and when the machine is stopped at the end of each day.

Carrier rods and narrowing rods should be oiled at least once a week. The sinkers, dividers, and striking jacks should also be oiled once a week.

Preventing Rust and Wear.

One of the causes for deterioration of knitting machines is rust, and rust forms easily on knitting machines because of the fact that the material is thoroughly moistened before it is placed on a machine and then the thread runs through a moistening trough resulting in moisture being sprayed on the machine, especially on the slur bar and carrier rods. The only thing to prevent rust is oil and therefore all rods and bars that are subject to rust formations should be covered with oil at all times. At least once a week these parts should be rubbed with an oily rag and if a knitter is inclined to have sweaty hands, these parts should be oiled by him several times a week.

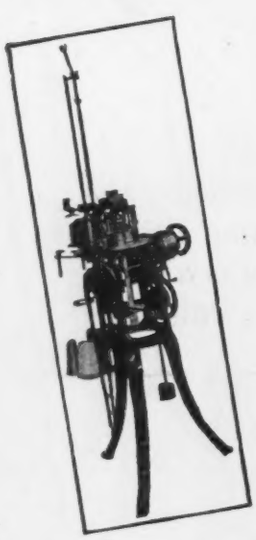
Knitting machines, like any other machinery is subject to wear and in order to prolong the life of a machine a general inspection should be made at least once a month to see if any parts are worn and need replacing. I find that when making this inspection that it is advisable to run the machine and then check up all cams and rollers. See that every roller revolves and if a roller is found that does not revolve, take this roller off to see if the surface is flat at any one place. If found to be flat, it should be replaced at once, as rollers that do not revolve will soon cause cams to wear down and result in trouble with the machine and cause the machine to produce poor fabric. The stitch cam and rollers should be examined thoroughly to see if it is worn and as soon as any signs of wear show on this cam, see that it is replaced. Narrowing cams and rollers should also be examined as worn narrowing cams and rollers will many times cause menders that could be avoided if the cams and rollers were not worn. The draw cam motion or coulier motion as it is sometimes called should also be examined to see if the bevel and pinion gears are meshing properly or if there are any broken teeth in the gears. The draw cam and rollers should also be examined, especially for the amount of play between the cam and rollers. Friction boxes should be examined, also rods and an examination should be made of the friction leathers. If the friction leathers should show signs of too much wear, see that they are replaced.

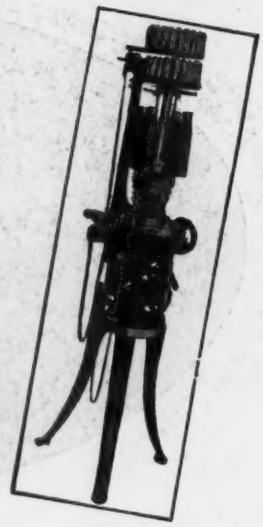
In making hosiery with what is called gum silk, the life of the so-called sinker heads will be prolonged if these heads are cleaned out with gasoline every two months. When a knitting machine runs for a period of time on gum silk, the sinker heads become clogged with the gum stripped from the silk and if this remains in the sinker heads too long it will eventually wear the sinker grooves. By pouring gasoline into the head ever so often, this gum will loosen up in the grooves, and with the running of the machine, this gum or dirt will remove itself out of the sinker heads. The sinkers and dividers with the needles is what makes good fabric and therefore, I strongly urge every manufacturer that he see that sinker heads are cleaned periodically. After sinker heads have been cleaned, it is well to test the play in the sinker groove to see if the grooves are worn and if this has happened, then the heads should be tightened, which can be done by turning down the screws on the top of the sinker heads.

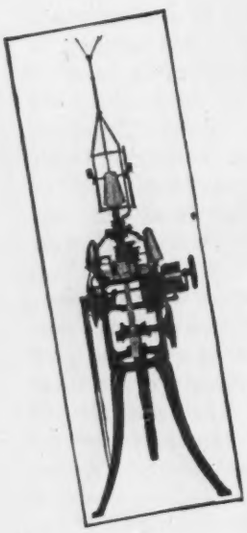
Another thing that should be examined and is sometimes neglected is carrier tubes, tension wires,

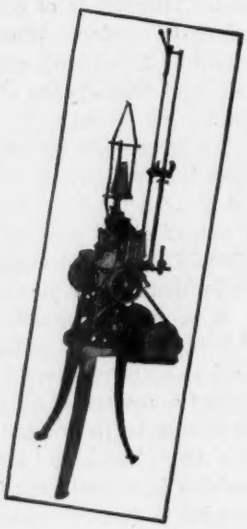
ALL TRUE-RIB

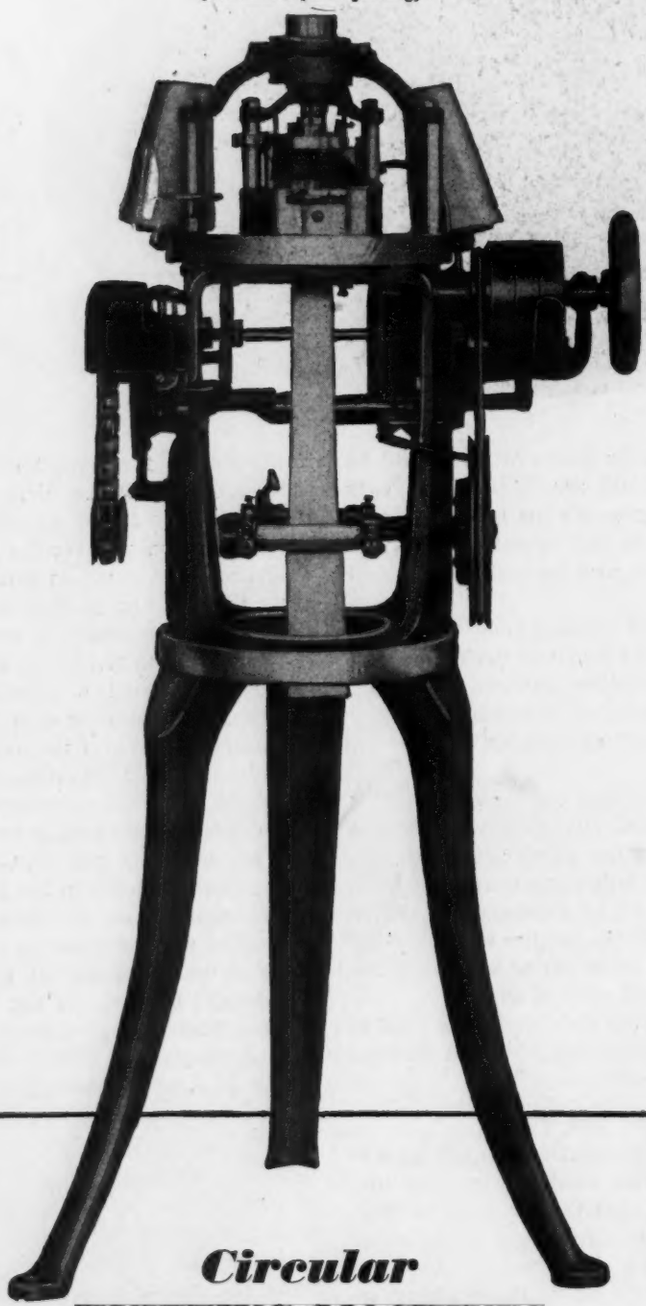
(Patented or patent pending)

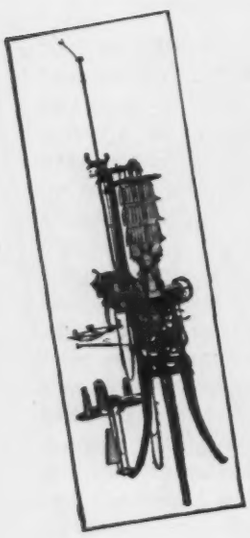


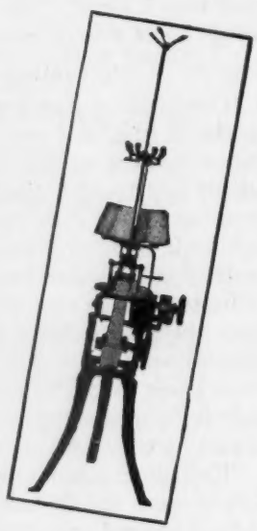












Circular

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THE FIDELITY UNIVERSAL RIBBER

snapper and snapper springs and felts in the moistening troughs, cut carrier tubes, tension rings and snappers mean press-offs and waste and these should be examined thoroughly when making an examination of a knitting machine. Felts become hard and gummy and result in the thread not getting any moisture, resulting in dry or sleazy hosiery. Cuts in the felts will also cause press-offs and therefore it is necessary to make an examination of the condition of felt every time a machine is inspected.

The general condition of the needles, sinkers, dividers and knocking over bits is something that should be examined when making an inspection of a knitting machine. Sinkers, dividers and knocking over bits and footer hooks that are cut, nicked or bent should be replaced and needles if out of alignment should be straightened. These are the parts that should be constantly watched by the knitter and he is the one who should be held responsible for the general condition of these parts.

Looping and Seaming.

Very little attention is required on looping and seaming machines other than seeing that they are oiled frequently and kept clean and free from dirt or lint.

On a looping machine the points break out frequently and these should be replaced as soon as broken. If a looping machine drops too many stitches, examine the condition of the point dial and if the brass grooves for holding the points are damaged in various places due to too many replacements of points or improper setting of points, then it is best to send the looping machine to the manufacturer and have the dial repointed by them.

The various thread guides and tension wires and cups on a looping machine should be examined occasionally to see if they are cut and if any are cut or worn, see that they are replaced.

On a seaming machine most parts that are worn will give the seaming machine operator trouble and the only thing on these machines that should be examined occasionally are the revolving cups to see if they are dented or nicked. Nicked or dented cups will make what is called a trap in the stocking, which at times will not break out until worn by the wearer. This sometimes damages many stockings, so it is well to examine these cups so as to avoid this trouble.

The Boarding Equipment.

In most hosiery plants one finds that the equipment that receives the least amount of attention or inspection is the boarding equipment, the work tables and work boxes. The only time an inspection is made of this equipment is when it is reported that hosiery damaged by pull threads have increased. When this inspection is made one usually finds many places that are rough or nicked on this equipment and when these places are removed the amount of damaged hosiery caused by pull threads is usually decreased.

Inspection of tables, work boxes and boarding equipment should not be made only when pull threads are on the increase but an inspection of this equipment should be made at least once a month. Whether this equipment is made of wood or made or steel, nicks and rough places will occur because of the usage and rough handling it gets. Therefore by making an inspection monthly and removing anything that might damage hosiery, many dollars can be saved through decreasing the number of damaged hosiery that is found after the hosiery is dyed and ready for boxing.

Removing Dirt and Grit.

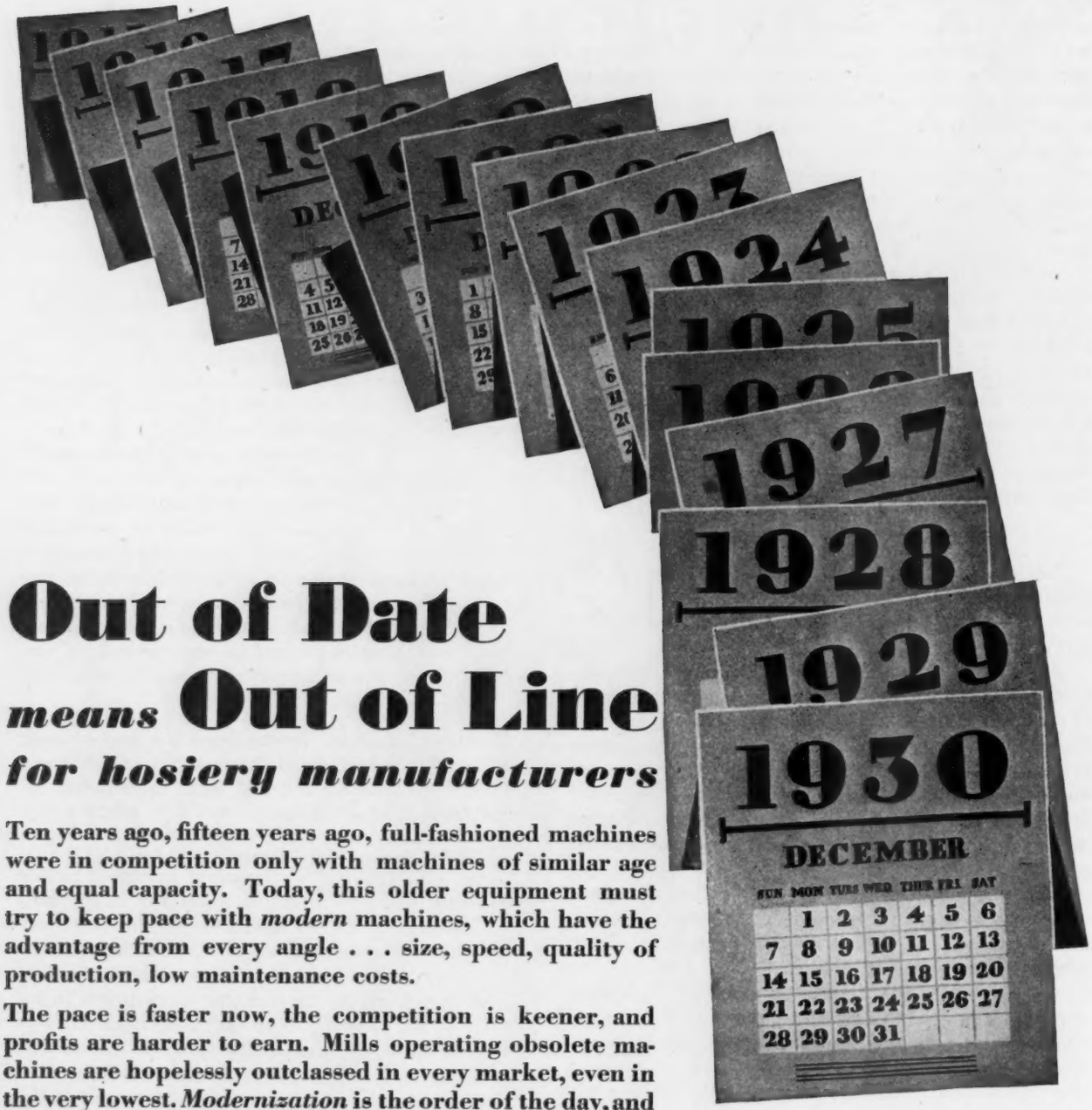
The general cause of wear and tear of machinery other than the natural wear is dirt and grit and therefore every manufacturer of hosiery should see that all machinery is cleaned at least once a week. Loose threads cause as much damage to machinery as any other thing known and when machinery is inspected for cleanliness, this is one of the things that one should have removed from the various parts of a machine.

On a knitting machine such parts as cams, rollers, draw cam and gears, catch bars, sinker heads, slur bars, carrier and narrowing rods, tension wires, floor pans, yarn boxes and shafting should be cleaned at the end of each week. Every two or three months a thorough cleaning should be given each knitting machine and it is best to clean sinkers with gasoline at the same time that the entire machine is being cleaned. Rust spots on machines should be removed and the best method I know for removing rust spots is with very fine emery cloth.

Winding machines, looping machines and seaming machines should be cleaned thoroughly each week and especially see that all lint and loose threads are removed from these machines.

Motors throughout a plant are also equipment that requires attention. The knitting machine motors should have constant attention, especially in the matter of oiling. The motors should be oiled at least every two weeks and they should also be cleaned at the same time. If possible some type of blower should be used on motors to blow out the dirt that accumulates in the interior of the motor. When oiling knitting machine motors, it would be well to instruct the person who does the oiling to also examine the quantity of oil that is in the draw or coulier cam pans. If the oil in the pan is too low then it should be refilled at once.

The maintenance of equipment in a full-fashioned hosiery plant is not a hard problem because the machinery as it is being built to-day is almost foolproof. Oiling and cleanliness is the main item that must be taken care of and if anyone will see that this is done at regular intervals and done properly, then the maintenance expense will be very small. Of course, there is always the natural wear and tear to any kind of machinery and with full-fashioned hosiery machinery, the wearing of parts should be replaced as soon as seen, if one wishes to secure the best quality of hosiery at all times. It is the neglect of inspection that is costly, so I can only urge every hosiery manufacturer to see that inspections are made often and if this is done; I can assure them that the cost of maintenance will be a very small item and more and better hosiery will be the result through making a systematic inspection of full-fashioned hosiery equipment.



Out of Date
means Out of Line
for hosiery manufacturers

Ten years ago, fifteen years ago, full-fashioned machines were in competition only with machines of similar age and equal capacity. Today, this older equipment must try to keep pace with *modern* machines, which have the advantage from every angle . . . size, speed, quality of production, low maintenance costs.

The pace is faster now, the competition is keener, and profits are harder to earn. Mills operating obsolete machines are hopelessly outclassed in every market, even in the very lowest. *Modernization* is the order of the day, and now, while business conditions permit it, is the time to install machinery which shows immediate and lasting profit.

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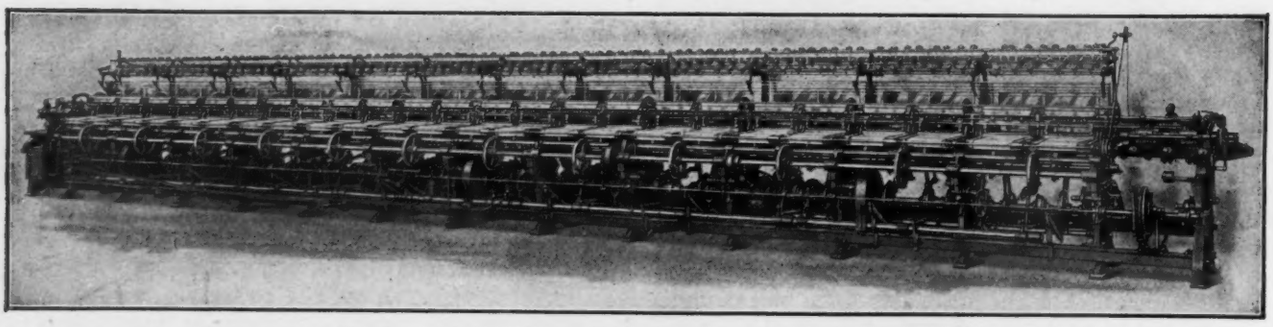


The Reading Full-Fashioned Knitting Machine as it stands today—after 32 years of development—is the lowest priced, highest producer ever offered.

The Dyeing and Finishing of Rayon

By Noel D. White

THIS ARTICLE is the last of a short series on this subject by Mr. White. The previous sections appeared in the January and March issues of last year, and discussed the nitro-cellulose, cupra-ammonium, viscose and cellulose acetate groups, their affinities for dyestuffs, etc. In the present article he discusses, among other things, dyeing in contrasting colors, recognizing the different rayons, and the identification of the different types by simple tests. He also points to the need of informing the dyer of the type of yarn being purchased, in order to secure best results.—EDITOR COTTON.

AS THE USES for rayon had gained such a proportion in the textile industry and the demand for it increased every day for all classes of goods, it was up to the dyer who aimed to please his customers to find dyestuffs that would give the best results with a minimum amount of labor. In the case of Viscose, cuprammonium and chardonnet rayon the selection could be made amongst the existing dyestuffs already in the hand of the dyer, the question for him being to choose the dyes most suitable for the kind of rayon in process.

The Acetate Rayons.

In dyeing acetate rayon, however, the dyer soon found that none of his dyes were practical for this fiber. Different processes in dyeing and preparing this fiber with any of the accepted methods to increase the affinity of the fiber for the dyes proved unsuccessful. Clearly it was a problem for the chemists and the dye makers to solve and naturally if the manufacturers of acetate rayon wanted their product to gain a foothold in the field they had to find a way to dye it and had to co-operate with the dye maker and devise suitable processes and proper dyestuffs to which task they applied themselves with such determination that today there are a number of dyes and methods suitable for every purpose to which the acetate rayon may be put.

First Attempts to Dye Cellulose Acetate.

Owing to the difficulties encountered from the start the methods used in dyeing cellulose acetate fiber have been many, and rapid changes in the short time it had entered the field of textiles; while the other rayons are regenerated cellulose fibers they behave like cotton, except that they being in an activated form of cellulose have an increased affinity for cotton dyes. The cellulose acetate contains 40 to 60 per cent of acetic acid chemically compounded in the finished product and it was thought that a partial saponification of the thread would render its affinity for dyestuffs somewhat similar to the other rayons. By boiling in soap for some time the acidity of the fiber would be reduced and a film of regenerated cellulose produced upon the thread. It was claimed that by carefully regulating the temperature, the alkalinity and the length of the operation, a changed fiber could be produced containing from 60 to 70 per cent of unchanged acetate covered with 20 to 30 per cent of regenerated cellulose which could then be dyed with cotton dyestuffs same as other rayons.

Experiments were carried on along this line in a general way for ordinary dyeing but this process was never quite successful. The luster was impaired and dyeing was not satisfactory. This process, however, is followed when it is desired to have the cellulose processed and finished with a subdued luster.

Some suggested treating the cellulose acetate with a strong solution of ammonium sulphocyanide and some results were obtained with this treatment but it was never carried on to any great extent.

Attempts were made to produce a fiber having a greater affinity for basic and vat colors by mixing the spinning solution of cellulose acetate with from 5 to 20 per cent of a solution of nitrocellulose and denitrating the mixed fiber with a solution of alkaline hydrosulphide, but this process was not generally adopted.

Many other methods and processes were proposed and experiments more or less successfully carried on by investigators in many countries, however real progress in dyeing cellulose acetate only started after the discovery was made that certain dyestuffs of the order of the vat dyes, while insoluble in water, could be dispersed and made soluble by colloidal grinding or by treatment with Turkey red oil (sulphonated castor oil) and a new series of dyestuffs was developed, called S.R.A. dyes.

Dyeing Celanese.

This line of dyes was readily accepted by the dyer and found to be just what was needed. They are nearly as fast as the vat dyes when properly applied and their easy application, the variety of colors and adaptability to be mixed with one another to produce innumerable shades, make them a very valuable adjunct to the dye house where Celanese is to be dyed.

In a general way it may be stated that cellulose acetate is dyed with the S.R.A. colors in a soap bath at a temperature of 160 degrees to 175 degrees F. for best results. A higher temperature will impair the luster of this fiber, which, however, can be restored by a subsequent treatment with acetic acid.

When no special requirements for fastness are demanded cellulose acetate can be dyed successfully and easily with a line of dyes called the cetacyl which are applied without any special preparation. These dyes are dissolved in soft or condensed boiling water and applied without any assistant in a bath starting at about 120 degrees and raising the temperature of the bath to 160 degrees F.

Another line of dyes used is the azanil colors. These dyestuffs are dissolved by mixing with hydrochloric acid until reduced into a paste and then pouring boil-

ing water over them to the amount of 100 parts to 1. When properly dissolved the dye is poured into the bath and the goods dyed at the temperature of 140 to 160 degrees with addition of 10 to 20 per cent of ammonium acetate. Some of these colors can be used direct, others will not show up to their true shade until developed on the fiber in the ordinary manner for diazotized and developed colors. Cellulose acetate dyed by this method is quite fast for many purposes.

While there are other dyestuffs now being brought out that will dye successfully Celanese or any other cellulose acetate rayon the dyer contemplating entering this line of dyeing will do well to ask the advice of the people from whom the yarn is bought. They are always willing and are more qualified to give advice.

Celanese used in woven or knitted fabric very closely resembles real silk. Its luster can be subdued at will by boiling in soap or hot water and some beautiful fabric can be obtained but owing to this peculiar property of remaining undyed by any of the dyestuffs used for other fibers it is especially adapted for use in fabrics where multi-colored effects are desired. It can be mixed with other rayon or any of the natural fibers, cotton, silk, wool, etc., to produce contrasting colored effect.

Here, however, is where the dyer must exercise great care in order to obtain acceptable work. While cellulose acetate cannot be dyed with the usual run of dyes used on other fibers it has a habit of picking up any impurities and may be stained by many dyes. Dyestuffs must be selected that are confirmed by experiments to leave the Celanese unstained. There are a number of dyestuffs that are proven to be excellent for this purpose and it is plainly up to the dyer to select and strictly adhere to them. The writer has knowledge of several cases where the dyer after having learned to do work with Celanese in cross dyeing quite successfully for a time, let himself be convinced by some glib tongued salesman that he could get the same or better results with cheaper dyes only to find himself in trouble with results quite different than he anticipated.

Dyeing Fabrics in Contrasting Colors.

When woven or knitted with rayons of the regenerated cellulose type, Celanese can be cross dyed and any two different and contrasting shades may be put on in the same or in separate baths. The S.R.A. dyes will go on the Celanese and leave the other rayon uncolored to be subsequently dyed with any of the dyestuffs selected to leave the Celanese unstained and when in a mixture with cotton the same procedure can also be followed.

If the pattern is made up of Celanese and real silk, if proper attention is paid to the boiling off, time, soap and temperature carefully regulated, the Celanese can be dyed while the silk is being boiled off and the latter dyed afterward in an acetic acid bath to the color desired and this bath will to a certain extent restore the luster to the Celanese. If a three colored effect is desired and only two fibers are in the fabric it is obvious that one has to be dyed a fast and resisted shade before being put in the fabric, but if any regenerated cellulose rayon or mercerized cotton, cellulose acetate and silk or wool enter the fabric in combination design, each fiber may be dyed a different color and some very striking and pleasing effects obtained in one, two or three separate baths. The dyer may choose, according to the pattern, the method most suitable and some beautiful work has been done by any of the three methods. The most important thing to keep sight of is a careful choice of dyestuffs and chemicals.

Recognizing the Different Rayons.

The dyer whose lot is to dye rayon in any form in mixture would be in a better position to do good work if he knew at all times what kind of rayon he has to contend with. He should be informed of any change his employer intends to make in making up his goods. While this seems reasonable enough and to be expected, unfortunately this is not always the case. When buying rayon the dyer should be given a sample to dye and compare with previous lots to make sure it is the same quality and approximately up to standard. Instead of that the buyer in many cases secures his yarn and puts it in the goods and then sends the work to the dyer and lets him worry about what to do with it. This is not only the case with rayon but also with other fibers and while it may not be so bad in the case of real silk, any dyer who has handled rayon, mercerized yarn and wool will readily agree with me that this practice is not conducive to peace of mind on the part of the dyer and many of the bad and indifferent dyeings could be avoided if the dyer would be taken into the confidence of his employer and consulted when buying yarn or contemplating a change.

While it may not be the common practice this method is, in the experience of the writer, actually the case in many instances, and in order to give the dyer who may be confronted with the job of having a lot of rayon, or goods mixed with it, of unknown kind the means of finding out what he has to dye, of recognizing the kind of rayon on hand, the following is given:

Simple Tests for Rayon.

There have been published before this numerous tests for artificial silks, and the tendency is to continually try to find simpler means of telling them apart. The Bureau of Standards of the United States has a short time ago announced one of the easiest tests of all and this is here given. The sample of rayon to be tested is treated with an equal part of concentrated sulphuric acid and iodine. The reaction will be as follows:

Viscose rayon turns a dark blue color; acetate silk turns yellow; nitro-cellulose rayon turns violet; cuprammonium silk turns a light blue color.

Since Viscose and cuprammonium silk both react blue it is advisable to make the following confirmatory tests: Treat the rayon with concentrated sulphuric acid alone and observe the color of the solution after fifteen minutes; Viscose rayon turns a red-brown color, cuprammonium turns yellowish brown.

Knowing the type of rayon he has to deal with, the dyer can always proceed with assurance and not be groping in the dark until he has spoiled a batch or two before he finds out that he was treating his goods with the wrong kind of chemicals and dyestuffs.

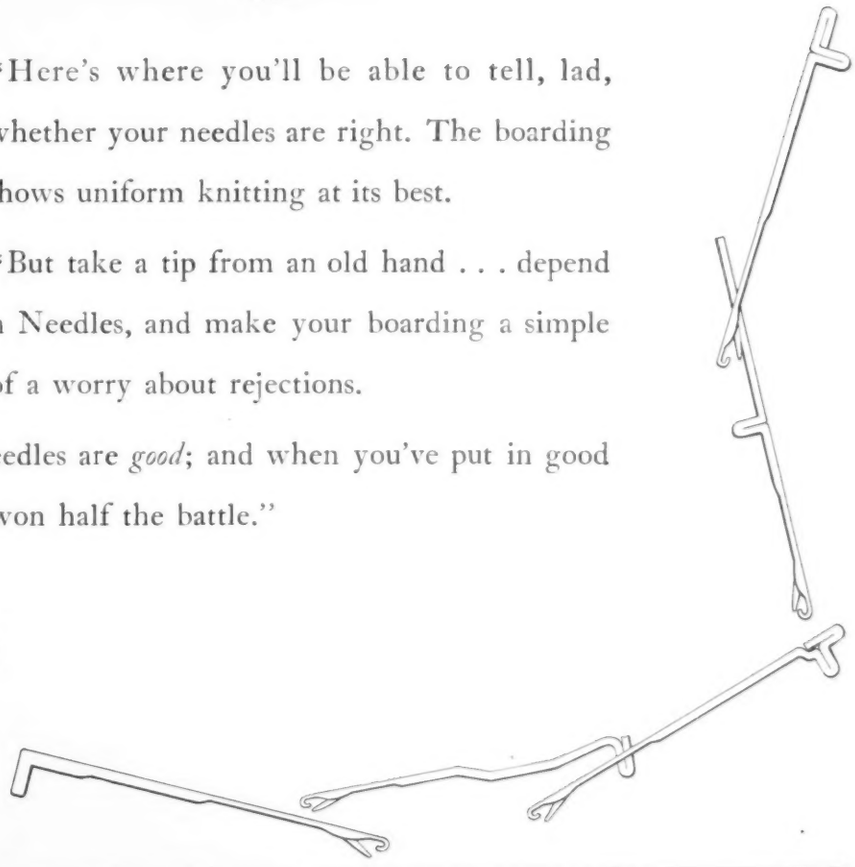
The Old Knitter Talks

"Here's where you'll be able to tell, lad, whether your needles are right. The boarding shows uniform knitting at its best.

"But take a tip from an old hand . . . depend upon Torrington Needles, and make your boarding a simple routine instead of a worry about rejections.

"Torrington Needles are *good*; and when you've put in good needles, you've won half the battle."

The red box with the green label



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Only a Machine can draw a perfect CIRCLE!

IT is *machine precision* which makes the perfect circle "perfect." This accuracy of circumference is maintained by a mechanical device, which produces circles one after the other . . . exactly alike . . . invariable.

Torrington needles achieve absolute uniformity; for they are *machine made* . . . today, tomorrow, every day the same. And they turn out knitting the way you like to see it turned out . . . *smoothly, steadily* and *uniformly.*

The red box with the green label. Packed 1000 to the box. Each box contains 10 packets of 100 needles wrapped in glazed paper.

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The Torrington Company

ESTABLISHED 1866

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What is the Best Size Seaming Thread?

Tell this man if he is not using the right kind. If so, what else could cause the trouble?

EDITOR COTTON:

I want some of your good readers to come to my aid and tell me the best size and kind of seaming thread to use for service weight full fashioned hose. At the present time I am using 80s/3, but I have encountered quite a bit of trouble with drop stitches on the seam. Any suggestions along this line will certainly be appreciated.

CONTRIBUTOR No. 4908.

Backwinding Emulsions for Full-Fashioned.

Two more men give their ideas on this important subject. Further opinions from other readers are invited.

EDITOR COTTON:

Discussion with regard to solutions or emulsions for backwinding silk for full-fashioned manufacture was recently requested by "CONTRIBUTOR No. 4905." He wanted to know whether standard make emulsion mixed with soft water are better than soluble olive oil mixed with regular hydrant water; and also whether soft water causes more rust on the machines than regular hydrant water.

Not being familiar with his particular conditions, I cannot say whether standard make emulsions mixed with soft water will give better results than soluble olive oil mixed with hydrant water. Conditions vary so much in different localities that what one mill finds satisfactory will not be suitable for another.

We do believe, however, that comparative tests covering the following points would enable a mill to make a thoroughly intelligent decision as to which is the better to use:

(a) Emulsion should cover roll in the form of a film.

(b) Whether or not one emulsion softens the silk and holds the moisture better than another.

(c) Running qualities of silk on the machine.

(d) Appearance of fabric after knitting and also after dyeing.

(e) A few needles in different test tubes containing various emulsions would show in a comparatively short time whether or not there is a tendency for rusting to take place.

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

(f) Some emulsions have a tendency to oxidize more easily than others, thus causing discoloration of the silk fiber which results in shade variation after dyeing. This is always a problem and is oftentimes due not to the emulsion alone, but to allowing the silk to stand damp too long previous to knitting.

In conclusion I would say that we do not believe that the use of soft water will cause any more rust on the machines than regular hydrant water.

CONTRIBUTOR No. 4930.

EDITOR COTTON:

I note that "CONTRIBUTOR No. 4905" would like to have some full-fashioned knitters tell him whether standard make emulsions mixed with soft water are better for backwinding silk than soluble olive oil mixed with regular hydrant water. He also wishes to know if soft water will cause more rust than hydrant water.

For the contributor's information, let me say that the proper kind of water is very essential for backwinding silk, regardless of what kind of a solution is used for making an emulsion and as he, no doubt, knows, each locality has different water conditions, therefore one cannot always say that water taken from a hydrant is the kind of water best adapted for backwinding.

The best water to use is soft water, as soft water has better penetrating qualities and this is what is wanted for backwinding. All throwsters use water softened through a water softening device because they find that soft water is needed for the proper soaking of silk.

As far as water causing rust on the machines, this depends a great deal on the kind of water in any locality, but my experience has been that soft water

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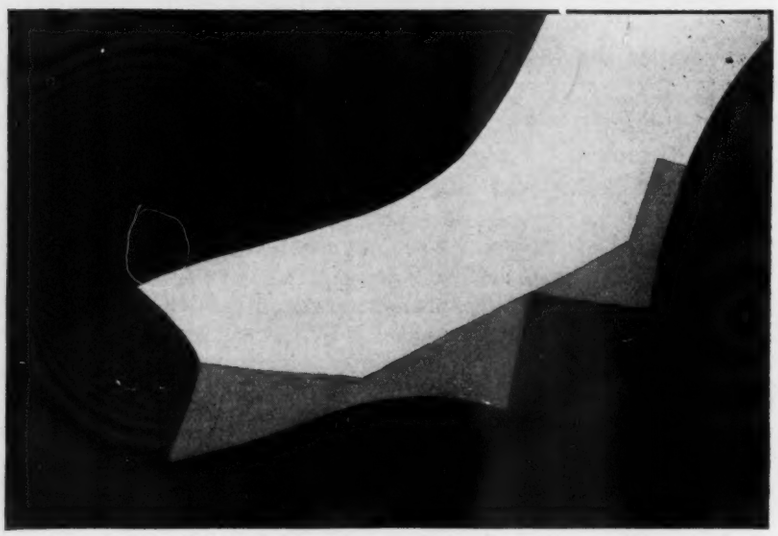

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softened by a softening process will create very little rust.

I want to caution the contributor about the so-called prepared solutions for making emulsions, if he wishes to prevent rust. The main object in making up solutions for backwinding purposes is to have an emulsion that will penetrate through the silk and also retain the moisture for a period of time. Most of the so-called commercial prepared solutions on the market have an ingredient put in to give the emulsion made from these solutions a penetrating and moist-retaining quality, but this ingredient is usually a rust creator and the rust forming on a machine is not the fault of the water that is used in mixing the solution but is due to the solution used in making the emulsion.

The best solution that one can use for backwinding is one made out of the oils that the throwster used in soaking the silk and using soft water instead of hydrant water. This is sure to give the desired results as naturally if the oils used for soaking are giving the desired results on a knitting machine then the same oils will give the desired backwinding results. It might also be well for the contributor to have his hydrant water tested as to softness or hardness; also as to the kind of water it is; and a chemist who does testing will tell him if the water is fit to use for silk purposes, also if the water will or will not cause rust.

However, I can say to the contributor that there are not many cities or towns where one will find hydrant water that is good enough to use for backwinding and this is one of the reasons why a great many manufacturers of full-fashioned hosiery have water softening and filtering devices, so to be sure that the water is as good as possible for the purpose of backwinding silk.

C. H. BAXTER.

The Value of Needle Straightening.

EDITOR COTTON:

I am going to tell of a method that I have for training full-fashioned knitters in the art of needle straightening, hoping that some of the readers of your magazine will be able to derive some helpful suggestions from it. I have certainly obtained some wonderful results since adopting the system.

I recently transferred from another mill to the one with which I am at present located, and quite naturally one of the first things I wanted to do was to get a check upon the ability of my full-fashioned knitters to plier needles. I am afraid there are too many knitters who fail to place the proper amount of importance upon this very important item, for straight needles make the difference between good knitting and bad knitting.

I started out by requiring every knitter in the mill to straighten ten needles each week. He then turned these needles into the office in a special envelope for this purpose, as shown in Fig. 1. The needles are turned into the office for the good psychological effect it has upon the knitters. These needles are then looked over very carefully. The proper notation, such as "very good," "good," "fair," etc., is then placed opposite "General Appearance" marked on the envelope and the needles returned to the knitter.

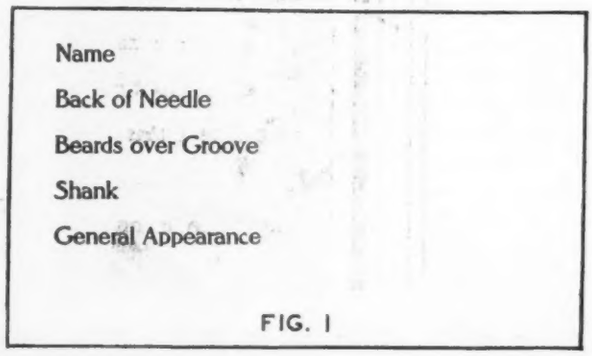


FIG. 1

This continues for each knitter until he becomes so proficient in pliering needles that he will get a mark of "very good" for three consecutive times. After he receives this mark three consecutive times he is notified that it wil lbe unnecessary for him to turn any more needles into the office.

Every Thursday between shifts we have an instructor give lessons to those who need it in pliering needles. Naturally we find some knitters that have a very difficult time trying to master the art of straightening needles, but taking everything into consideration, we have been exceptionally pleased with the results that we have obtained. The large majority of men appear real serious and make an honest effort to learn. Within two months after the method was put into effect the needles that went into the machines were 50 per cent better than those that had previously been put in.

CONTRIBUTOR NO. 4843.

Causes of Bad Sizing on Rayon and Celanese Half-Hose.

Several opinions giving a variety of probable reasons for this difficulty. Further discussion is invited.

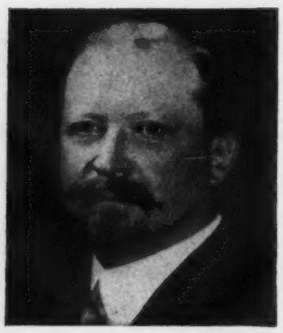
EDITOR COTTON:

This is written to discuss the causes of bad sizing on rayon and Celanese half-hose, which was brought up by one of your contributors in a recent issue.

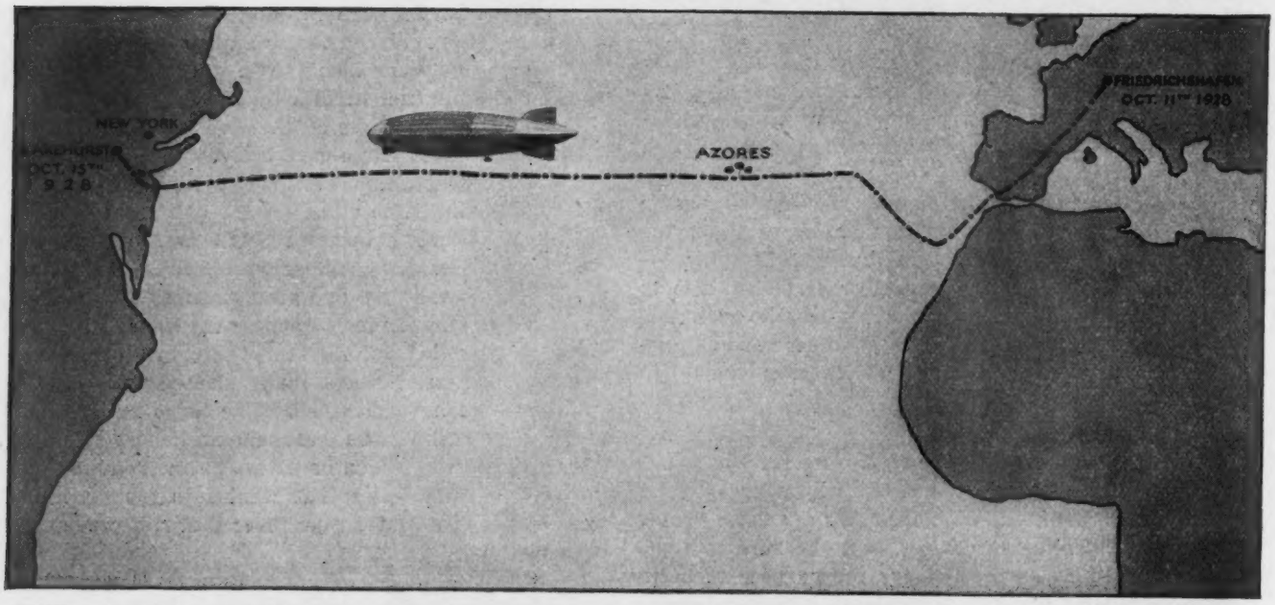
We have found that the following factors will cause bad sizing. I will list them, and then discuss each in order. They are:

A—Temperature of knitting machine.
B—Amount of oil on yarn or cone or bobbin.
C—Method of threading yarn.
D—Type of winding.
E—Tight or loose wound cones.
F—Humidity.
G—Machine speed.
H—Uneven denier of rayon.
I—Age of yarn after lubricated.

A—Temperature of knitting machine. To reduce bad sizing of rayon and Celanese constructed half-hose, it is very necessary that the temperature of the knitting machine should be as uniform as possible, and the machines should not be too cold when started in the morning. They should be loosened up somewhat at the start and the sizing control gradually tightened as the machines warm up. A good fixer who knows



TO THOSE WHO SAID "IT CANNOT BE DONE!"



NOTHING but gratitude is felt toward those who publicly declared that it would be impossible to build a *full-fashioned SINGLE UNIT hosiery knitting machine.* Their statements now emphasize the success of Reiner in once more "accomplishing the impossible."

Dr. Reiner believes in doing the difficult. He was the first paying passenger on the Graf Zeppelin's first transatlantic voyage, because he believed in Dr. Eckener and disputed with those who predicted that Dr. Eckener couldn't do it. That voyage was symbolical of Reiner's career—surmounting impassable barriers in order to bring broader service to other business men.

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how to size is a vital factor here.

B—The amount of oil on the yarn on the cone or bobbin—affects the sizing more than any one other factor. In mills that purchase their rayon in skeins and do their own winding there are several causes for uneven oiling. There are several ways of winding rayon. In one method the yarn is wound from skeins direct to cones. In the other it is wound from skeins to wooden or metal bobbins. The equipment of each mill determines the method, and the type of hosiery produced by different manufacturers has caused them from experience to favor one particular type of winding or the other. The methods of oiling rayon for skein wound yarn are as follows:

a. Hand methods of oiling. By pouring a certain amount of oil in each end of a ten-pound bundle of yarn; spreading out in a box and spraying by hand or air pressure oil spray; by dipping in a container and wringing out or allowing to drip. This is a very wasteful method, disturbs the filaments causing bad winding and tangled skeins, and, worst of all, distributes the oil unevenly on the rayon.

b. Roller oilers on silk winders. In this method the thread skips over the rollers and does not get oiled evenly; the viscosity of different oils affects the amount of lubricant taken up by the roller; the troughs gum up very quickly.

c. Troughs with wicks on winders. In this method the wicks are cut through quickly by the thread and do not oil equally. The wicks cannot be adjusted, so capillary attraction is not the same for each bobbin. When the machines are started at the beginning of each shift, the wicks are thoroughly saturated and the first winding is heavy with oil, which gradually dwindles off to more nearly the correct amount wanted.

d. Immersion and extraction. Each ten-pound bundle of skeins is slipped from its wrappings into a fine mesh net bag, similar to those used in dyeing hosiery. The bags are carefully placed in an extractor direct connected to a tank of rayon soaking oil, the valve is opened and the oil bath covers the bags of rayon. It is soaked exactly five minutes, after which the surplus oil is drawn back to the storage tank and the lot is extracted thirty minutes. Thus each lot having the same immersion and extraction time period, the saturation is always uniform. Silk lubricated prior to winding will wind much better.

C—Method of threading yarn. A group of machines on one particular style of hosiery should all be threaded exactly the same. This should be a standard practice. If knitters on separate shifts thread their machines differently, or even change the method of threading without having the machine sized, bad fitting hosiery will result; the friction or tension on the yarn will not be the same.

D—Type of winding. The type of winding determines the surface friction or drag upon the delivered yarn as knit. The filler or bobbin wind has the least drag and is more uniform. It cannot be excelled for making plaited hosiery. Small diameter bobbins should never be over eight inches high, or the sizing of the finished hose will vary according as the yarn comes off the top or bottom of the bobbin as used up.

Bobbins held over several days after oiling and before using should be covered, as the volatile parts of the soaking oil will leave the outside very dry by evaporation. This will cause rings in the hosiery and uneven sizing. Bobbins not thoroughly cleaned up of yarn each time, will oxidize at the base, and this rewound yarn will size unevenly and dye likewise.

E—Tight or loose wound cones. The frictional or surface drag varies greatly on loose and tight wound cones. Where one bobbin or cone is emptied on a knitting machine and is followed by another, uneven sizing results. The drag and swift weights on the winders should be kept as uniform as possible, and the threading here should be watched, too.

F—Humidity evenly controlled is a great help in sizing. Without it bad lengths will result.

G—Machine speed. Knitting machine belts that pull irregularly, causing the speed to greatly vary, will not size even. The belts should be kept tight.

H—Uneven denier of rayon. Rayon that runs off size obviously will size poorly. This condition is seldom encountered now, but several years ago was a trouble of its own.

I—Age of yarn after lubricated. In mills using the old methods of oiling rayon, poor sizing results by knitting up too soon after winding. The oil does not get distributed evenly. The remedy here is to hold over twenty-four hours.

CONTRIBUTOR NO. 4820.

Another Discussion of Grenadine.

Baxter gives his views on the difference in Grenadine for full-fashioned and seamless, etc.

EDITOR COTTON:

I note in a recent number that "CONTRIBUTOR NO. 4869" would like to know if there is any difference between Grenadine silk which is thrown for a full-fashioned machine and that thrown for a seamless machine, having the same twist in the silk. He also asked how the Grenadine silk is treated before knitting on both types of machines.

In reference to the question as to whether Grenadine silk is thrown differently for a full-fashioned machine from that thrown for a seamless machine, and if there is any difference in the treatment of the silk, I will say that it is my understanding that there is no difference in the throwing operation for making Grenadine silk other than the soaking method. In soaking Grenadine silk for a full-fashioned machine, the throwster will soak the silk so that it will give a 25 per cent boil-off loss instead of a 23 per cent boil-off loss. The reason for this greater percentage of boil-off loss is that on a full-fashioned machine the silk must be moist to make a good fabric and at the same time hold its moisture. By soaking the Grenadine silk for a 25 per cent boil-off loss, the silk will knit better because it is more pliable and will retain the moisture in the cones during the knitting operation because of the softness of the silk. In soaking Grenadine silk for a seamless machine, moisture is not required the same as knitting this silk on a full-fashioned machine, therefore the silk is soaked so as to give a 23 per cent boil-off only.

In reference to the question of whether silk throwsters make a difference in throwing any kind of silk for a full-fashioned machine from the methods used for a seamless machine, will answer this by saying "No." In the throwing of silk the mechanical operations are all the same as far as throwing silk for full-fashioned machines and seamless machines are concerned. The only difference in throwing silk for individual customers is the matter of turns per inch and the soaking formula. The average number of turns used for either machine is three and one-half turns per inch, though some manufacturers ask for two and one-half turns where others will ask for four or more. The soaking of silk is also done as per specifications from the customer. Some manufacturers of both seamless and full-fashioned manufacture will insist on only a 23 per cent boil-off loss, others desire the silk soaked with a 25 per cent boil-off loss because of the better results obtained, especially in manufacturing full-fashioned hosiery.

Therefore, in the throwing of silk, it is not the throwster who has any set or standard method of throwing silk, as far as soaking or turns per inch is concerned, but it is the manufacturer of hosiery who gives the throwster the instructions as to how he wishes the silk to be thrown. The throwster must follow out these instructions if he wishes to retain the good will of the individual manufacturer, and any good throwster will always see that the silk is thrown as per instructions received from his customer.

C. H. BAXTER.

Making Stocking Knit Looser in Middle of Sinker Heads.

EDITOR COTTON:

I noticed in the November issue that "CONTRIBUTOR NO. 4830" would like for me to give him an explanation as to just how I make my stockings knit a little looser in the middle of the sinker heads on full-fashioned machines which I probably failed to clearly outline in my article, "Sleaziness—and Preparing Silk for Knitting," which appeared in the June, 1930 issue of COTTON.

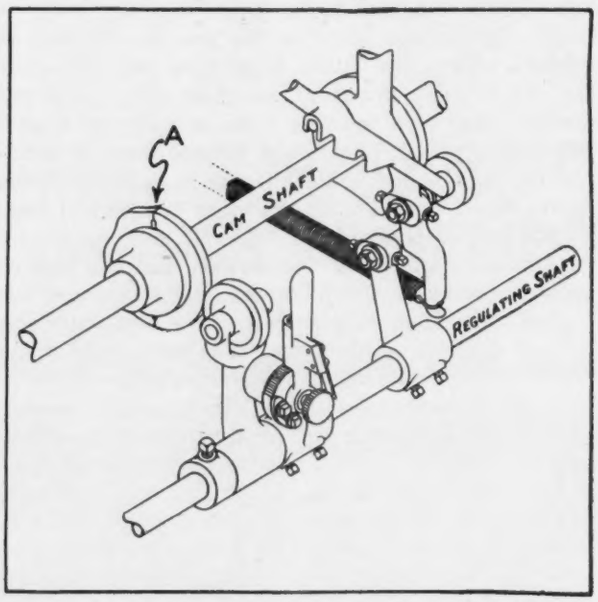
In my article in the June issue I had the following to say as to means of preventing sleaziness:

'Be sure that the wedge plate has no nicks in it, due to the sinkers striking it and making an uneven stitch. Make certain that all sections are knitted even in length. Check up on the take-off roll strap. If they are spring rolls, make certain that they are adjusted evenly.

"I would make the stocking knit a little looser in the middle of the sinker heads, because those sinkers are used the hardest. That will help to make more of an even stitch in the stocking, and the take off will be more even.

"This will take some of the looseness along the sides out. The sinkers that are not in the narrowing, due to not being used all of the time, will make a longer loop."

Now in addition to this which I outlined in my previous article, I would also like to advise that the following be taken into consideration: needles being in line and spaced properly; it should be carefully noted that there is no kick in the slurcock, as this will cause holes to be cut in the stockings on account of the uneven striking of the jacks; and it should also be seen that the jacks have no cut grooves.



Now to answer "CONTRIBUTOR NO. 4830" as to how I make a stocking knit looser in the middle of the sinker heads. Doing this will take bagginess out of the sides. This is accomplished by placing a piece of cardboard about 9/1000-inch in thickness underneath the round part of the regulating cam, which is shown in the accompanying sketch at *A*.

I hope that I have cleared the situation up for your inquirer; however, if I have not, I hope I will be called upon for a further explanation.

CONTRIBUTOR NO. 4893.

Causes of Bent Latches on H H Machines.

Tells of the importance of latch opener setting.

EDITOR COTTON:

In the October issue "CONTRIBUTOR NO. 4847" said that he was having trouble with bent latches on his H H sinker reverse machines. He said the machine goes out of the welt into the rib and pulls the last 20 of the long needles and the first 20 of the short ones. The needles were being pulled out against the throat plate on the right hand side. The result was bent latches and some hooks pulled off.

It is my opinion that the latch opener is causing the trouble he refers to. The latch opener requires very delicate setting, and if by any chance it is set too close it will cause bent latches, especially if the needles happen to be a trifle out of line.

It is also possible that "CONTRIBUTOR NO. 4847" is using a yarn that is a little too heavy for the gauge. This will cause bent latches and broken dial hooks.

CONTRIBUTOR NO. 4936.

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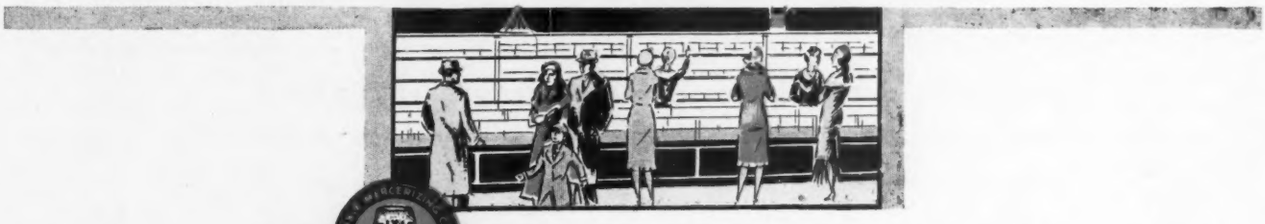

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The KNIT GOODS MARKETS

IT HAS COME to be more generally recognized that there is an unbalanced production of women's silk full-fashioned hosiery which presents itself as a problem more difficult of solution than the mere fact that there remains to be found a process by which output can be adjusted to consumptive demand and held stable while the industry is getting on its feet after the most serious slump it ever has experienced.

Over-production could, of course, be reduced to a rational level simply by manufacturers closing mills and keeping them closed for a time. One difficulty of putting such a program into practice would be that while probably a majority of the plants are in need of orders and their owners ready to accept a reasonable volume even though the margin of profit remained inadequaate, a few are being operated to the absolute limit of capacity on a day and night schedule. The fact that this is so discloses an unbalanced situation, in which gauge and courses may not play a really very important part as determining just why small mills should be crowded with orders and operating profitably while the industry as a whole has been doing little better than moving along in unsteady fashion. A well known mill executive commenting on the problem uses the case of the Melko Hosiery Mills in Philadelphia as an example.

The Melko mill was acquired some few months ago —around the middle of 1930—by A. Kommel & Son, New York jobbers. It was being operated at the time by Lee I. Robinson, the owner, who is recognized in the trade as a manufacturer who had managed to turn some difficult corners, although his entry into the hosiery field was made not so many years ago. When the Kommels bought the plant Mr. Robinson became the manager from the production standpoint, and since then it has been kept running day and night, as was the case in January, when some attractive orders were declined because production had been sold to beyond the time when shipments against the orders offered was specified. And, beginning February 1st, the Melko mill had announced occupancy of an entire floor at 1239 Broadway as the main office, where stocks will be carried.

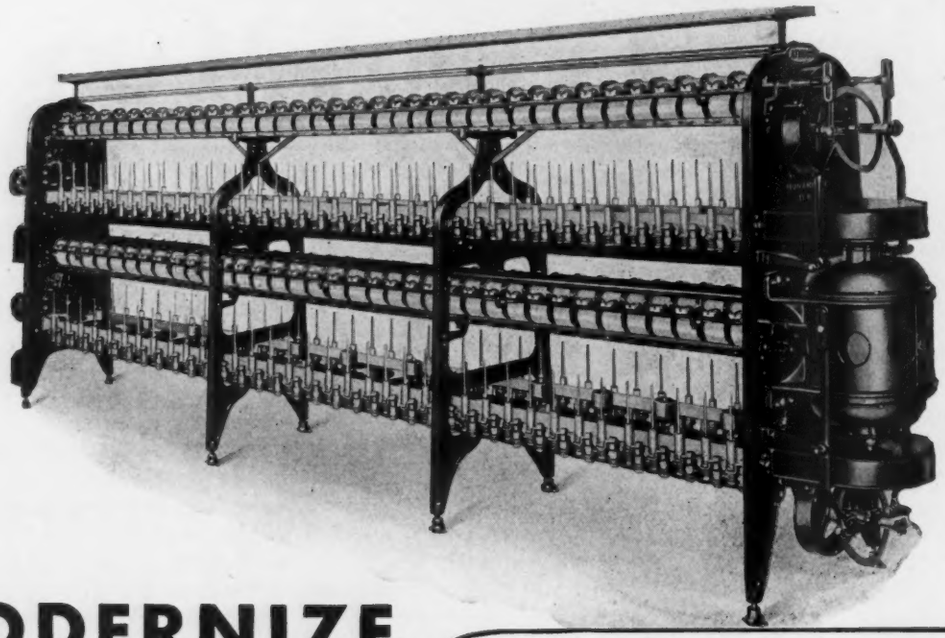
The Kommel firm has not been accused of offering its product at less than at least average market prices, so that selling below value cannot be ascribed as the explanation for its apparently sold-up condition and declining orders while plants in the immediate neighborhood on a comparable footing had not gotten a start with 1931 business. The Federal Knitting Co., another Philadelphia full-fashioned organization, not in the large group, recently announced an expansion campaign, so far as related to distribution, and discontinued selling direct, to sell through Amory Browne & Co., and make a drive for more business in its full-fashioned silk half-hose division, while introducing one or two new members in women's full-fashioned. About the same time C. V. Williams, the general manager, announced having acquired for his own account the full-fashioned mill of the Rowe Hosiery Co., established two years ago in Philadelphia by two mill men who had come from Holyoke, Mass., and sold their product through the Holyoke Silk Hosiery Co., according to a directory of the knitting trades. The Federal company and its manager are apparently, as in the case of the Melko, in step with the movement toward a more profitable hosiery market.

The solution of the marketing problem by the two concerns cited is, of course, their own affair entirely. Others have done as well in pulling themselves out of the depression plight. Many have not. Why, may never be told. Some have been and still are waiting for an organization of manufacturers to do for them what some units are doing for themselves, and for some weeks there have been reports from a substantial source that a small group of mill executives is having unheralded conferences in efforts to find a way for heading the full-fashioned industry back toward its status of a few years ago. The prospect for success has not been revealed nor has trustworthy information of the steps taken to date been obtained by those not immediately identified with the gigantic undertaking. It is indicated, however, that, while not on so ambitious a scale as the plans of Julian Armstrong when attempting to organize the Full-Fashioned Hosiery Exchange, the proposed foundation follows pretty closely the lines laid down by Mr. Armstrong. It was hoped to progress to the extent of giving the situation a lift that might be calculated to eliminate much of the market confusion by the time the spring campaign gets underway.

Say Manufacturers Slow to Supply Facts for Dr. Taylor's Survey

IT HAS BEEN SUGGESTED time and again in mill circles that if manufacturers were as enthusiastic in adhering to an organization as in the preliminaries for participating in its activities, the organization might be sufficiently effective to start the patient on the road to recuperation and avert a relapse.

Lack of manufacturer cohesiveness seems to have been manifest in the efforts of George W. Taylor of the research department of the University of Pennsylvania to supply an authoritative survey of the full-fashioned industry. While Dr. Taylor has declined to comment on the reasons for delay in completing the survey, as of January 1, it is heard among manufacturers that some of the important concerns have declined to supply the information asked for. One reason advanced was that it would be inexpedient to have the result of the survey reach dealers and the general public; that if the information could not be confined to manufacturing circles it might prove more harmful than helpful. In any event, mill heads have been far from acting in concert, leaving the completion of Dr.



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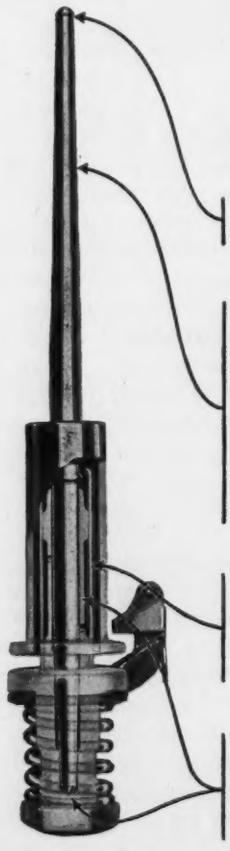

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The ball top identifies this Atwood Spindle.

Blade troubles are now an evil of the past. This remarkable Ball Top blade will run true and stay straight under any service conditions. It combines extreme strength and elasticity by use of the latest metallurgical developments.

Less frequent oiling and constant and rapid circulation of oil are possible with this patented step. Cool running spindles are insured.

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5034

Taylor's census of the full-fashioned hosiery industry to the future, while the aim was promptness, in order that manufacturers might be better able to shape their 1931 program for production and marketing.

More Price Revision Looked For.

It was believed in manufacturing circles in January that the low prices for hosiery of 1931 production remained to be set, as, it developed, some manufacturers had not reduced operating cost to the level of some of their more successful rivals. Low prices at which certain items in hosiery were obtained by department stores for their January special sales left the impression that surplus stocks were heavier than had been contemplated. There was no evidence along toward the end of the month that the surplus had been reduced to the danger point, from the buyer viewpoint, for, it was pointed out, prices in the stores indicated there was, somewhere, a sacrifice of profits and losses being taken, even though a large per cent of the industry had been idle for four to six weeks.

It appeared that direct-to-retailer mills committed, in a way, to their list prices, were the more conservative in matter of going ahead. Even though some of the larger establishments in this group had announced downward revisions, their owners were proceeding ultra-cautiously while waiting for an expression of retailer sentiment, which road salesmen have been industriously engaged in sounding for some weeks. Branded lines, it seemed, were, generally speaking, adversely affected by not having the same leeway enjoyed by the un-identified. The latter proved a more easily marketed proposition, it appeared, as being taken by a class of buyers who let it be known that they give attention only to offerings at "minimum wholesale prices," although buying as retailers—one of the evils in an over-supplied market.

Although, with numbers of mills—some of them among the larger—idle and evidence of much distress hosiery being offered, most manufacturers operating plants at or near capacity and selling their production believe that the crisis was passed in January. They attach minimum importance to the proposal that some few mills will announce further moderate reductions. Where such action is taken, it is maintained, operating cost had not been reduced, and not until bottom has been reached in cost will prices begin to reflect a step in the direction of stability. Then, it is the opinion of some of the conservatively optimistic, consumption will increase with the lower prices in effect more generally, buyers for the trade will be less hesitant to place orders for future and, with consumption increasing and demand from stores becoming more pronounced, there will be a definite turn toward the employment of more operatives. And what applies in this line of reasoning to hosiery necessarily will apply to some other textile industries.

Manufacturers Wary of Novelties.

It is noted by observers among buyers that few manufacturers are giving more than passing thought to hosiery novelties, it having been demonstrated that the path of least resistance is, at the moment, among staples. There are, of course, attempts at innovations representing no wide departure from the field of staples, and one of these coming under more recent notice was a proposed eight-thread silk 45-gauge stocking, with cradle foot and silk to picot. It was produced in very small quantity, submitted to a number of buyers for the retail trade, and pronounced an ideal medium service weight stocking. The mill sold none, although making a liberal distribution of samples. The trade liked the stocking but not the price. The manufacturer reasoned that, if sold on a close margin and winning consumer approval, it would be but a short time before others would be producing a somewhat cheapened number, with which he would have to compete, and sacrifice that for which he brought it out—profit. The mill happened at the time to be, and still is, comfortably situated as to orders for a stripe cotton top, cradle foot, medium service weight in the popular price range and profitable, and has a strong run on picot four-thread of both 42- and 45-gauge, and a five-thread number of 42-gauge construction.

Not all of the mills making 42- and 45-gauge stockings of silk, for women, are marketing capacity output, some having to bid for orders in these gauges, while operating every 39-gauge machine and disposing of all they can make without seeking buyers. In several mills having diversified equipment, in matter of gauge, it was learned quite recently, the finer gauge were being run only against orders and were idle a large part of the time, while the 39-gauge machines were being operated solid weeks, with no night-time layoff.

Mills in the smaller class, being active only when they have orders, have been taking in silk on a like basis, supplying no shipping details when not running. This puts the silk supply establishment in a predicament, from two angles. It is left to carry the bag for the manufacturer and is bitterly criticized by those calling in silk steadily. Mills, it develops, are calling throwsters to account for supplying silk to small concerns reputed to be price cutters and to others being favored with extraordinarily "convenient credit terms", and some have discontinued drawing supplies from throwsters against whom this indictment is laid. The throwster is liable to counter with the reminder that most of the present successful mills were at one time small concerns, and that some, if the silk houses had not extended long credit, would have gone on the rocks instead of riding out the storm.

Harder for Buyers to Beat Rivals' Prices.

It is regarded an encouraging sign for manufacturers of the better grades of popular-price hosiery that buyers for department stores are finding it increasingly difficult to conform to the notions of their merchandise managers. The latter, concerning themselves mainly with department earnings, are asking the impossible of buyers when, noting a low price in some store, give instructions to meet it, and "beat it if you can." The buyer finds that since prices have had a descent running over a long period, they often cannot meet another store's price, except they accept depreciated goods. This may give them the merchandise manager's arbitrary scale of profit, but result in a loss of patrons, and when they drop off the buyer is

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• About Fifty Converters • represent your Major Market

Are you properly contacting them?

FRANKLIN Process Colors are nationally advertised to the retail, wholesale, cutting and converting trades. They are the only colors used in yarn dyed fabrics which are so advertised. In advertising Franklin Process Colors we have set for ourselves a high standard of quality and service. We know that we must closely approach this standard if our advertising (and therefore our business) is to be permanently successful.

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It will, we believe, best pay users of colored yarns in the long run to keep the confidence of their customers by giving them what they want. Substitutes may or may not be "just as good." It really doesn't matter, because when all is said and done, they are substitutes. They are not what the customers specified.

The thing that does matter in the long run is a reputation for integrity and for knowing and supplying the demands of the trade.

APPROXIMATELY 50 converters do most of the business in yarn dyed cotton and rayon woven fabrics. They place the lion's share of the business.

These converters consult with Franklin Process, headquarters for colored yarns, when styling new merchandise. They or their brokers frequently ask Franklin Process for a list of mills that are equipped to make a certain fabric and that will run Franklin Process Colors when specified.

Franklin Process, because of conscientious, legitimate service, rendered for nearly twenty years, is in a unique position to bring converters, brokers and mills together—converters who specify Franklin Process Colors and colored goods mills willing to run Franklin Process Colors when specified.

Colored goods mills that thus contact converters of yarn dyed fabrics through Franklin Process, enjoy special advantages. Just what these advantages are, will be explained in detail upon request. No obligation.

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FRANKLIN PROCESS CO., PROVIDENCE, R. I.

Please send your booklet No. 1 explaining the advantages of contacting converters of yarn dyed cotton and rayon woven fabrics through Franklin Process.

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Adv. 379

Fast Color Identity is Now the Master Salesman

in a worse plight, and more than one has admitted in quite recent months that running a hosiery department in a big retail store "is a killing job if one holds on long enough."

While the business of selling and buying hosiery hardly can be said to be on the mend, price changes are in more orderly fashion, demand is showing some little improvement—in spots—and there is less hesitancy among certain wholesale distributors to buy further into the future. The indicated betterment is, however, confined largely to certain mill lines, and manufacturers in their sales efforts are giving less attention to the matter of gauge.

The producer of fine-gauge goods that are lagging and must be sold at a shading from value to be moved in competition, does not relish, of course, naming a price equivalent to quotations for coarser gauge. So, he may elect to capitalize a buyer's estimate of his ability to discriminate and leave gauge to his judgment. A service-weight stocking put on the market by a direct-to-retail mill lately is not described by gauge. "That is something we are not interested in," says the management. "Our trade takes it without any reference to gauge and is satisfied with it. No one buys it for believing it is a 45- and does not care whether it is 42- or 39-; so why should we worry?"

The Berger chain of exclusively one-price hosiery shops in Philadelphia for several years maintained a price of $1.15 for both medium and chiffon weights, but late in 1929 announced a reduction to $1.10. Other nickel cuts followed, until now, as it has been for some months, the price is 95 cents. The manager of the chain corporation, when asked if he was giving his customers the same gauge as when the price was 20 cents higher replied, "We sell stockings; not gauge; customers never inquire the gauge."

This company in January got into production in a mill of its own, a new plant, and now is exploiting a service weight stocking at $1.25, which has been approved by experts as a better bit of merchandise than most offerings at that figure, but hardly superior to two or three mill lines sold in one of the exclusive shops for one dollar a pair. Which suggests merchandising knowledge as accounting for an unbalanced hosiery situation. It seems in order to state, however, that certain of the mills in rural areas appear, in a general way, as the more successful producers of acceptable grades of service weight hosiery for the popular price range.

Low Prices for Full-Fashioned Silk Give Seamless Silk and Rayon a Jolt

LOW PRICES for right good full-fashioned hose have left some of the hitherto more successful manufacturers of seamless silk with the lightest business they have had at any time in recent years, it is stated by executives of several producing organizations who in the last year or two modernized their plants by installing fine gauge equipment. These mills are the harder hit, executives complain, by reason of the introduction of full-fashioned rayon to be sold at 50 cents a pair in retail stores. One concern reports booking a fair amount of business from retailers at $4.50 a

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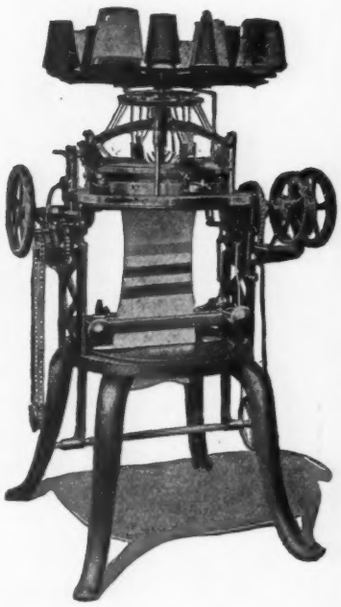

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Brinton Knitting Machines are the biggest backing that you can give your sales force—the biggest help to your jobbers and retailers—the biggest value to the ultimate consumer.

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ABERFOYLE MANUFACTURING

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pair, which, until the recent reduction in the prices of rayon thread, was believed to be bottom for rayon full-fashioned. Buyers insist upon a price for 50 cents a pair goods. Although rayon hose at $4.50 has, in the case of one mill line, the French heel, is knitted rayon to top and is of dull luster, dealers say it could not be offered successfully at more than 50 cents, with some stores in city shopping centers selling pure-thread silk chiffons—not otherwise described—for as low as 69 cents. Some leading manufacturers who discontinued their silk-rayon combination numbers report practically no call for them and regard them permanently out of the picture, so far as their mills are concerned.

Silk Rayon Popular in Half-Hose.

Silk and rayon is reported by some manufacturers an increasingly popular combination for men's half-hose, with a decrease in demand for rayon-cotton construction. It was understood a few weeks ago there were some rather weighty stocks of rayon half-hose made from rayon taken in some time before the reduction. In any event, suspicion that was the case had a dampening effect on straight rayon and rayon in mixture. The mischief was caused, however, by predictions of reductions which preceded by some weeks official announcements of the cut, and pure thread silk socks were not exempt from the influence of prospective declining prices of rayon. The fact that raw silk has been showing more strength and prices increasing, has had the effect, somewhat, of offsetting the influence of reductions in rayon, and little complaint of the state of business is heard in the markets for half-hose. There seems no doubt, judging from off-hand reports of manufacturers, that stocks are lighter than in most divisions of hosiery.

Pure thread silk full-fashioned socks for men are reported in diminishing call, due, for one reason, it is asserted, to the fact that numbers of retail stores are maintaining the same prices at the counter as when they were paying $8 a dozen, comparing with $6.75, the price of some lines of merit. It can be stated on actual knowledge that full-fashioned silk stockings of identical make of dollar goods three years ago still carry the dollar price tag. This in contrast with 50 cents a pair for seamless plain silk formerly 75 cents.

Better Deliveries for Infants Socks Called for by Jobbers; Retailers Buying

DELIVERIES of infants' socks were too slow in January for numbers of jobbers. Manufacturers retorted with the statement that where shipments were late the blame lay with the merchants. Orders were detailed late and in consequence were late in being put in process, as leading mills were disposed to attach not too much faith to undetailed orders. When finally specifications were received, coming from scattered jobbers, mills were behind in their production campaign. It was regarded a wholesome situation, however, with the market so bare of distress goods that distributors were dependent upon the manufacturers shipping out what had been ordered.

The trade regarded it fortunate that the price

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JOIN the large number of manufacturers of hosiery who have discovered that BUDDY OIL for Back Winding produces superior results.

For a number of years the Specialty Products Company has manufactured this oil for back winding full fashioned hosiery yarns. A growing list of customers—which includes many of the largest mills in the country—agree that a better oil cannot be had at any price.

This outstanding factor contributes to the popularity of BUDDY OIL for Back Winding.

Write for information.

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Southern Representative

W. M. FAILOR
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Standard-Coosa-Thatcher Durene—a mercerized yarn of inherent quality—meets them all—with a wide margin—

There's Workability—so essential in keeping down costs

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Durene
STANDARD COOSA THATCHER

drop in rayon was not announced until most of the socks orders on mills' books had been completed as to delivery. Jobbers, in anticipation of a cut, withheld specifications until the retail trade began to exert pressure for shipments. Children's lines generally escaped the rayon price cuts and are rated by the trade in a better position than usual just prior to breaking into spring business. Juvenile hose and infants' socks, like men's half-hose, had nothing more serious than the drop in rayon with which to contend, while women's silk, full-fashioned and seamless, was left in a state of confusion by the turn of affairs in relation to grenadine, which until a few months ago was depended upon by many mills for immunity from price slashing such as has been witnessed in tram silk lines.

Even before the results of experiments with dull silk in a variety of turns and form of twist not protected by the Westcott patent for grenadine were reported, a line of 320-needle seamless dull hose of very high-grade construction, which a few months ago was receiving attention at $8 a dozen from certain large retailers, was offered for $4.50 and proved not attractive to buyers for the trade. Since then, obviously, with buyers giving laboratory tests to dull silk of other than grenadine twist, and in many instances giving it preference on the matter of lower price, there is reported a stronger drift to the dull. Not a few dealers regard dull silk as not promising of long holding out against the silk with the sheen.

The developments intended by certain throwsters to give grenadine a setback continue as a source of confusion, with dealers divided in opinion. Grenadine sustained its first shock when elements among retailers began using chemically dulled silk stockings, while leaving the consuming public to infer it was the extensively advertised grenadine.

Propose Central Finishing Plants for Groups of Manufacturers

PROMISE that the full-fashioned hosiery industry will emerge from its plight, and probably sooner than some interests contemplate, is given in the action of unorganized manufacturers, recognizing the seriousness of conditions, who are taking steps for a remedy, which, according to an apparently majority opinion, lies first in reducing cost and then application of ethics which can be enforced only through organization of an element which, while perhaps not representing a majority, will be sufficiently powerful to accomplish by persuasion what some have sought to bring about by compulsion.

While one organized group, as noted, is having conferences for a study of means for effecting an approach to market stabilization by some sort of regulation of production, another is working on concentration plans, and is considering the establishment of a central dyeing and finishing plant in a given community, where all manufacturers comprising an organization subscribing to this proposal and others having to do with wage adjustments, would have their dyeing and finishing done, discontinuing, if they saw fit to do so, the plants maintained in connection with their respective hosiery factories. Such a scheme is being

Leadership

today, is earned in the laboratory. Specialty Products' chemists developed ELM OIL for Silk Throwing several years ago. Since then a strong force of specialists has unceasingly labored to improve on the product. The result is that they have found the original ELM OIL well-nigh perfect—and unimprovable to date.

But Specialty Products' principle of leadership must be maintained—so research goes on and on.

If a better product than ELM OIL is found, Specialty Products Company will find it.

Used by leading manufacturers of silk yarn, hosiery and knitted fabrics.

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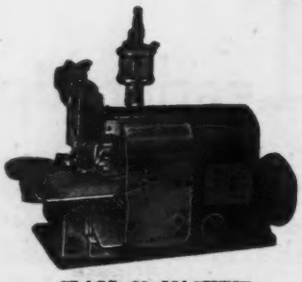

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INQUIRE ABOUT NEW MERROW MACHINES

STYLES 60-ABB and 60-D3B

For simultaneously trimming and joining ends of cotton, silk or woolen piece goods with a

FLAT BUTTED SEAM

Permits goods to pass through finishing machines, uninterrupted, for such operations as Shearing, Calendering, Mercerizing, Bleaching, Dyeing and Printing—with *remarkable saving*—both in labor and fabric.

Butted Seam, natural size, made by STYLE 60 ABB MACHINE on Cotton Goods which have been subsequently processed. The STYLE 60 D3B makes a similar though much wider seam designed for use on sleazy or loosely woven goods to insure holding.

OTHER RECENT DEVELOPMENTS—FOR THE RAYON TRADE

STYLE 60 RD —For a three-thread overedge finish, either straight or scalloped, on Rayon Bedspreads and other sleazy articles on which the ordinary edge finish will not hold.

STYLE 60 JDC—For two-thread FLAT SEAMING on Rayon Underwear.

Let Us Demonstrate the Work of These and Other Machines on Your Own Fabric.

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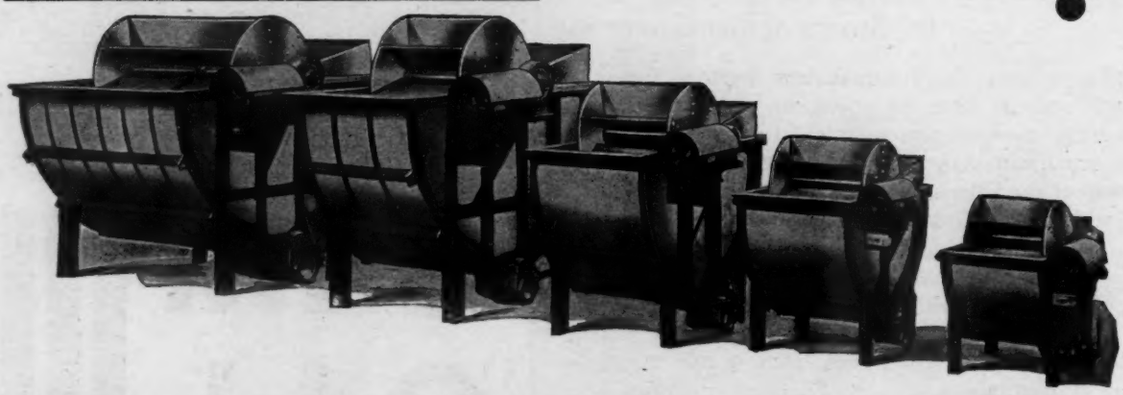

STRICKLAND MONEL METAL PADDLE DYEING MACHINE, Motor or Belt Driven, in a Sturdy Cast Iron Frame

Hosiery dyers will welcome the corrosion resisting cast iron frames, mono-cast side frames and cast iron angle end frames.

These frames are made extra heavy and rigid to reduce vibration. Motor, belt or chain drive at your option. Capacities 5, 10, 25, 50 and 100 lb. sizes. Other sizes built to order.

Write today for price and delivery.

STRICKLAND PATTERN WORKS
Chattanooga, Tennessee

worked out by a manufacturer occupying a salaried position in a small organization of full-fashioned mills, it is stated by members of his organization, although vouchsafing no official information.

A central finishing plant is said to be one of several proposed plans for bringing down the cost of producing finished hosiery in order to be more nearly in line with the trend to economy of production, all in the keeping, for the moment, of executive secretary of a manufacturers' organization.

With a like object in view, but from a different motive, one of the larger full-fashioned organizations in Philadelphia in January began buying hosiery in the gray, while not operating its plant. The company, it is stated, anticipates a stiffening market pending action by manufacturers for eliminating or remedying conditions which leave buyers in a dubious frame of mind. It is figured that buying hosiery in the gray from plants having a very low overhead cost and dyeing and boarding as needed, will be a less costly proposition than operating a large plant part time or only a small part of the plant full time, and does not detract from the number of operatives needed in employment.

Snappy Trading in Light Weight Underwear; Heavies Lagging in an Open Price Market

THE MORE ENCOURAGING news from the underwear primary markets originates this mid-winter in the light weight group. Prices for men's summer "lingerie," as dainty looking garments sometimes are described, are attractive, and dealers like the styles. In fact, said one of the more experienced distributors of underwear in a large way to retailers, "I never have seen better merchandise than in some of this year's light weight underwear for men. This, in conjunction with the low prices, which are unusually favorable to retailers, probably accounts for the steady flow of orders."

The person quoted, who is the underwear manager for one of the larger wholesale establishments in the East, says that virtually all of the orders reveal light inventories, as a result, in part, of last year's hand to mouth buying. This year, he believes, from the character of the garments into which manufacturers have injected more of appeal, retailers will sell relatively more of summer weights than in 1930. It is pointed out that, therefore, manufacturers who have been holding production down to little more than orders, may have to produce along more liberal lines.

The sharp declines in shipments in November compared with those for the corresponding month of last year is said to have moved manufacturers to push curtailment deeper in December. The trend, according to market observers, is to shirts and drawers, for both men and boys, although production of both materially declined in the closing months of last year, with output of men's light weight union suits falling around 40 per cent in November from the similar month of 1929.

Men's heavy-weight cotton underwear is being offered in only a desultory way, prices to be adjusted to opening figures, the opening being set for about the middle of February.

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DO YOUR Paper Boxes
Bespeak of Quality?
The attractiveness of the box in which your product is packed oftentime influences a sale.
The very appearance of Old Dominion boxes bespeaks of quality, for these are "individualized" boxes, made especially for your requirements, and with your own design on them you have a quality box that commands and gets attention. Our five centrally located plants can give you prompt service on your box requirements—any type or size. Samples and quotations given without obligation.
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QUITEX
SPUN RAYON

Textile mill men who are taking the pains to investigate the practicability of the new Quitex Spun Rayon are finding profit and satisfaction in its fashionable dull lustre and unusual strength.

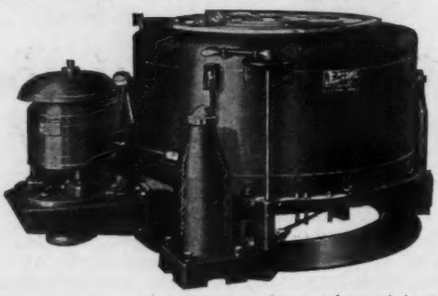
To those who see the possibilities of Quitex, and who appreciate the Quissett 20 year tradition of fine cotton spinning, are assured added impetus to fabric sales.

It will be worth your time to write for samples of Quitex Spun Rayon.

Quissett Mill
New Bedford, Mass.
Wm. H. Butler, Pres.
Edward H. Cook, Treas.
Thomas F. Glennon, Agent

QUISSETT MEANS QUALITY

You've *plenty* of room for it!



You won't have to jam up your other equipment to make room for the husky O-T. It extracts a mighty lot of work in mighty little space. You won't have to fix up a special foundation, either.

Mechanically simple, amazingly compact, tireless—the O-T will soon show you some new extracting profits. Find out about the silk-finish basket, with its side sheets of monel metal—get *all* the facts on the profit-making O-T.

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The pioneers and leaders in rayon weaving are Loper clients. They have found our system especially adapted for accurately figuring advance costs on fancy and rayon fabrics.

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Late 1931 Start for Most Knitted Outerwear; Knitted Sports Suits for Women Sell Freely

MANUFACTURERS of the more attractive and higher price lines of women's knitted sports suits probably represent the more active group in the knitted outerwear division of textiles. Some of the factories are on full-time schedules of operation, well supplied with orders, and new business reported developing from week to week. The suits are made from fine count two-ply worsted yarn out of fine wool, numbers of the mills using zephyr yarns almost exclusively. It appears, from reports of a half dozen mill heads, that the better grades of light weight worsted suits and sweaters lead in demand, and that some of the larger department stores have placed substantial orders.

Among the Knitting Mills

LARKWOOD SILK HOSIERY MILLS, INC., Charlotte, N. C., will begin installing from 5 to 10 additional full fashioned knitting machines in the early spring, it is reported.

Highland Hosiery Mills, Hickory, N. C., have changed their name to Whisnant Hosiery Mills.

Maurice Mills, Thomasville, N. C., are installing new machinery which will bring the capacity of the plant to approximately 1,500 dozen pairs of hose per day.

New knitting machines are being installed at the Corinth Hosiery Mills, Inc., Corinth, Miss. They will be installed at the rate of three monthly until 24 have been installed. The schedule calls for installation of 80 machines before the work is completed. When the plant reaches capacity, 600 people will be employed, and the investment will have reached $1,000,000.

The Novelty Hosiery Mills, Marion, N. C., have installed 12 new Hemphill wrap-stripe half hose knitters which will produce 650 to 700 dozen pairs of silk and silk and rayon hose per week. This is a new line with the plant, and increases the capacity of the plant to nearly 3,000 dozen pairs of socks per week.

It is stated that 100 knitting machines will be installed in the new building which has been constructed to replace the building of the Trenton (Tenn.) Mills, which was destroyed by fire last year.

Robert & Co., Inc., of Atlanta, have completed plans for an additional story to the Davenport Hosiery Mills, the erection of a boiler house and new dyeing and finishing plant, which will cost about $150,000. Bids were taken the 15th of January.

The Cramwell Lee Hosiery Mills, Pikeville, Tenn., which were recently organized to take over the Pikeville Hosiery Mills, are now operating on full time shift, manufacturing 8000 dozen pairs of hose monthly. The capacity of the plant will be more than doubled with the installation of additional machinery and a dyeing and finishing plant, which will also be installed.

Archer Hosiery Mills, Columbus, Ga., have let contract for an addition to the plant and have ordered the following equipment: 24 full-fashioned hosiery machines from Textile Machine Works, Reading, Pa.; combined heating and humidifying system from Parks-Cramer Co., of Charlotte, N. C. Lockwood Greene Engineers, Inc., are the engineers and A. K. Adams Co., of Atlanta, are the contractors.

Additional machinery is being installed in the full-fashioned department of the May Hosiery Mills, Inc., Burlington, N. C., as part of their program of expansion.

C. L. Amos, High Point, N. C., recently purchased 96 seamless knitting machines, 23 loopers and 8 sewing machines from the Griffin (Ga.) Hosiery Mills and will install them in the Melrose Hosiery Mills in High Point.

A portion of the Mountain City (Tenn.) Knitting Mills was recently destroyed by fire but will be replaced.

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The YARN MARKET

Philadelphia, Pa., January 17, 1930.

THE YARN MARKET last month had its usual amount of ups and downs. One week it would appear that prices were to remain fairly stable for awhile, to be followed the next week by a series of price recessions.

The first week of this report period, the week of December 22nd, was similar in many respects to those about which rather depressing items have already been written. The low prices which were so prevalent at this time did not seem to prove any incentive whatsoever in encouraging buyers to purchase. Of course, though, a declining market never has stimulated but very little buying.

Most sales yarn mills were running at this time, not in an attempt to make a profit, but merely in an effort to hold their organizations and give their employees work. It was estimated by local yarn interests that production of yarns was about one-third normal, and naturally this increased curtailment increased the production costs. Spinners felt, however, that it was wiser to curtail than to continue to take low priced business. The Christmas holiday coming during the week was another reason for a rather small amount of sales being reported.

The next week ushered in the New Year, and with it renewed interest on the part of many yarn sellers. Most sellers had been marking time during the past several weeks, believing that the New Year would bring an increase in inquiries and purchases. This feeling was beginning to become more pronounced at the present time than ever before, for yarn transactions had been at a standstill for sometime.

This increased feeling of optimism had a good effect in that it caused spinners to stiffen considerably in asking prices. This was especially true of spinners of carded weaving and knitting yarns. Inquiries and orders during the week were not hardly up to what had been expected, but the fact that spinners had stiffened as they did was encouraging in that it indicated that spinners intended extending their curtailment until they were able to obtain more satisfactory prices for their yarns. Wage adjustments had also tended to equalize conditions.

It was pointed out that retailers at this time should begin operating generally on the lower wholesale and raw material price levels that were prevailing at this time, as this would furnish the mills with business and cause many of the cotton goods manufacturers to cover ahead with yarns.

It was heard from rather authoritative sources at this time that 1931 stood an excellent chance of being a very good year from a standpoint of large volume sales in textiles. Yarn houses stated that there is an unusually large potential demand for heavy yarns. Manufacturers of heavy fabrics at this time were beginning to make rather confidential coveries ahead. Very few believed that there would be any unusual ascensions of prices, but pointed out that the cheapness of the raw material, plus the added incentive for closer co-operation between mills and sellers and more efficient manufacturing methods, should enable profits to be realized by both sellers and mills even though prices of yarns in general should be at a rather low level compared to what they were in 1929.

Buyers during the next week still appeared very cautious, and wanted to place business based on cotton being sold more or less freely at eight cents per pound. Spinners, however, were standing rather pat, and most of them indicated that they were out of the market definitely until prices became sufficient to net them a profit. They stated that they would remain "shut up" until prices made an advance or cotton made further recessions.

Philadelphia prices on January 15th follow:

Single Skeins

4s to 8s 17½	10s..... 18
12s..... 18½	14s..... 19
16s..... 19½	20s..... 20
24s..... 22½	26s..... 28½
30s..... 24½	

Single Warps

10s..... 18½	12s..... 19
14s..... 19½	16s..... 20
20s..... 20½	26s..... 28½ @24
30s..... 24½ @25	

Two-Ply Skeins

8s..... 18	10s..... 18½
12s..... 19	14s..... 19½
16s..... 20	20s..... 20½
24s..... 22½ @23	26s..... 24
30s..... 25	40s..... 32

Two-Ply Warps

10s..... 19½	12s..... 19½ @20
14s..... 20	16s..... 20 @20½
20s..... 20½	24s..... 23½
26s..... 24½	30s..... 25½
40s..... 33	

Frame Spun Carded Yarn on Cones

8s..... 18	10s..... 18½ @19
12s..... 19 @19½	14s..... 19½ @20
16s..... 20 @20½	18s..... 20½ @21
20s..... 21 @21½	22s..... 21½
24s..... 23½	26s..... 24½
30s..... 25½	40s..... 32½
30s dbl. carded ..... 28½ @29	30s tying in..... 24

Mercerized Yarn

Single	Two-Ply
30s..... 65	20s..... 51
36s..... 67	26s..... 52½
40s..... 70	30s..... 54
45s..... 73	50s..... 64
50s..... 76	60s..... 72
60s..... 85	70s..... 84
70s..... 1.00	80s..... 96
80s..... 1.12	90s..... 1.31
90s..... 1.50	100s..... 1.61
100s..... 1.80	

Mule Spun

Carded Yarn on Cones	Combed Peeler Yarn on Cones
10s..... 25	10s..... 34
12s..... 25½	12s..... 35
14s..... 26	14s..... 36
16s..... 26½	16s..... 37
18s..... 27	18s..... 38
20s..... 27½	20s..... 40
24s..... 30	26s..... 42
26s..... 31	30s..... 44
30s..... 32	38s..... 49
40s..... 39½	40s..... 50